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Rapport d'une recherche qui a duré trois ans et qui a conduit à élaborer, développer et évaluer un programme de transition s'échelonnant sur deux semestres pour les nouveaux collégiens en sciences sociales. Ce programme, destiné à faciliter leur intégration aux études collégiales, repose sur un enseignement fondé sur les habiletés. Il a été expérimenté et évalué au Campus Saint-Lambert-Longueuil du Collège régional Champlain.

RESULTS OF A THREE-YEAR STUDY

Transitional Learning for College:

An Abilities Based Curriculum for Social Science Students

Dianne Bateman

Glenna Loerick

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Cette recherche a été subventionnée par le ministère de l'enseignement supérieur et de la science dans le cadre du programme d'aide à la recherche sur l'enseignement et l'apprentissage.

On peut obtenir des exemplaires supplémentaires de ce rapport
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Dianne Bateman
Glenna Loerick
Yvon Geoffroy

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INTRODUCTION

The following report describes and documents a three year research project during which a two semester transitional program for incoming Social Science students was conceived, developed and evaluated. *Transitional Learning for College: An Abilities Based Curriculum for Social Science Students*, locally known as the *OMEGA Project*, was intentionally designed to promote the intellectual and social integration of each student into the college environment. In the first and second years of the project, teacher-researchers identified abilities that are associated with successful learning in the Social Sciences, and designed specific learning tasks that were used to both teach and assess these abilities. The objective of the third year was to operate and evaluate the project with the abilities based curriculum and assessment measures in place.

The motivation for this project came from a need to address three challenges facing postsecondary education: to maintain access, to increase retention and to guarantee the quality of graduates. Therefore, the project design and the structure of the curriculum is based on the findings of educational research in three important areas: the assessment of educational gains from postsecondary education; changing theoretical views of language, learning and cognition; and attrition and persistence in higher education.

A major challenge that we faced during the three-year period of this study stemmed from the fact that simultaneously creating and evaluating an abilities based curriculum required the use of both qualitative and quantitative research methods. An ability cannot be defined nor observed in the absence of the actual performance setting. Therefore, identifying abilities and designing assessment instruments to document their mastery required the use of naturalistic inquiry methods that allowed the data to emerge from the setting. To assess student learning, curriculum-embedded assessments that were situated in the classroom were designed and used to evaluate student performance within the classroom curriculum context. The goals of these asssessments were to gather evidence about how students were approaching, processing, and completing academic tasks required for successful performance in the

Social Sciences. Curriculum-embedded assessments focus on documenting the growth of individual students over time. To compare the performance of *OMEGA* students with student groups who were not working with curriculum-embedded assessments, however, required a quantitative research methodology.

It is impossible to describe, within the context of this report, all of the curriculum-embedded assessment tasks that were used to evaluate and document student achievement. It is possible, however, and perhaps more meaningful, to describe the iterative process that teachers went through as they designed these assessment instruments. Chapter Five details the work of Glenna Loerick and Yvon Geoffroy as they developed one important cross-disciplinary assessment task that was used to both teach and assess analytical thinking.

As we identified the abilities needed for learning in the Social Sciences we integrated the teaching of these abilities across the curriculum, experimented with new ways of assessing student learning, and structured a program that would encourage persistence in college. That process is documented on these pages. Chapter One outlines the conceptual framework that guided our project design and curriculum development. Chapter Two describes the project design. Chapter Three documents the process we went through to identify the intellectual abilities needed for successful learning in the Social Sciences, while Chapter Four explains how the abilities were integrated and taught across the courses. Chapter Five describes the process we used to develop assessment tasks and establish performance criteria. Chapter Six describes the quantitative measures used to compare the performance of *OMEGA* students with other student groups, while Chapter Seven reports these results. Chapter Eight discusses the implications of this project for institutional practice within the context of the current collegial reform. Finally, Chapter Nine offers specific recommendations to college administrations and college faculties.

We believe that the model that emerges from this research project has the principles, structures and curriculum building tools that can be used by individual teachers, small groups of teachers, departments, programs or entire colleges who want to better understand and improve postsecondary learning.

One

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THEORETICAL FRAMEWORK

Assessment in Higher Education

Concern about poor educational outcomes and the subsequent need for systematic educational reform have emerged as the most prominent educational issues of the last decade in both the United States and Canada. Students and their parents, government agencies and private industry have been pressing postsecondary institutions to demonstrate that they are providing quality education. At the root of these concerns is a crisis of confidence in the ability of postsecondary institutions to produce competent graduates who can contribute to social and economic progress. At the same time, it has become increasingly clear that competency in the college graduate involves, not only the acquisition of subject matter knowledge, but the ability to use that knowledge to solve complex problems. Subject matter knowledge acquired in college classrooms is fairly easy to teach and assess. The difficulty arises when one attempts to promote the cognitive and affective abilities associated with a successful college graduate. Abilities such as thinking analytically, reading critically, writing coherently, and working efficiently in groups are necessary outcomes of a college education if the graduate is to function effectively in adult life. However, it is these cognitive and affective abilities or outcomes that are difficult to teach and even more difficult to measure.

In the United States, an emphasis on assessing student outcomes began with the publication of four major reports on undergraduate education. The Study Group on the Conditions of Excellence in American Higher Education (1984), in its report entitled *Involvement in Learning*, called for the systematic assessment of students' knowledge, capacities, and skills. William Bennett, in *To Reclaim a Legacy* (1984), recommended curriculum reform, minimum standards, and assessment as possible ways to improve postsecondary education. One year later, the Association of American Colleges (1985), in *Integrity in the College Curriculum*, stated that the absence of institutional accountability is a grave problem and stressed that curriculum debates should not focus exclusively on course content but rather on learning outcomes such as the communication skills and critical thinking skills that students should attain through their courses (Astin, 1987). Most recently, the National Education Goals Panel stipulated that "critical thinking, problem solving, and communication skills" are necessary abilities for college graduates (NCEST, 1992). Because of its shared vision that assessment is a catalyst for improvement, "specific results-oriented goals" and "accountability for outcome-related results" were mentioned as popular reforms to pave the way for a nationally established system of educational standards and assessment.

In Canada, college systems in British Columbia (Dennison, Forrester, & Jones, 1982), Ontario (Allan, Darling, Hughes, & Rosenfeld, 1983), and Québec (Québec, Ministry of Education, 1978) also grappled with the challenge of examining their postsecondary institutions. *The Skolnick Report* (1985), commissioned by the Ontario Ministry of Education to study its college system, focused on postsecondary issues which are still unresolved in most provinces: the college identity, the role of faculty, the professional development of faculty and the quality of student learning. The *Commission of Inquiry on Canadian University Education* was conducted for the Association of Universities and Colleges of Canada to determine how well the universities were carrying out their educational mandate (1991). More recently, a three year study was undertaken which attempted to identify the *Criteria and Indicators of Quality and Excellence in Canadian Colleges and Universities* (Donald, Konrad, & Nadeau, 1994).

In the past, the value of higher education was automatically accepted and governments were quick to provide the financial support needed whether this meant building a city university system in New York, or a complex Cégep system in Québec. The primary objective, at that time, was to provide all citizens access to higher education. However, in today's economy, a college degree no longer guarantees increased future earnings. This reality places an even greater demand on educators to define and document the benefits of higher education. The goal of providing more access to postsecondary education has been achieved. American and Canadian political leaders now want to be assured that their investments are sound: they want to be assured that access has not replaced quality.

Another reason for the interest in assessment is the increased competition from other areas of the world and the need for more technically skilled graduates. Colleges and universities have always taken on the role of providing a well-trained labor force made up of skilled, competent citizens who can promote social and economic progress. Changing economic demands have forced postsecondary educators to examine whether the abilities of current graduates adequately meet the needs of today's global economy.

The issues raised in Canada and the United States regarding the question of quality are relevant to the Cégep (Collèges d'enseignement général et professionel) system in Québec. Cégeps were created in 1969 upon the recommendation of the Parent Commission to provide a route to postsecondary studies for students who would otherwise not have access. The Cégep forms a mandatory level of education between secondary school and university for those who seek further education, or between school and work for those who wish to earn a credential in a technical career field. It is unique in that it combines preuniversity and technical studies with a component of general education that is common to all programs.

The Cégep system in Québec has succeeded in increasing access to postsecondary education. Since its inception 25 years ago, enrollment has increased from 16% to more than 60% and the likelihood of enrolling in regular college programs before age 30 has increased from 38.9% in 1980 to 57.8% in 1990. However, like its American counterparts, its mandate, curriculum and pedagogical processes are currently undergoing examination and reform. The reasons for this current review are not unlike those that precipitated the reform movement in the United States. First, there is confusion and doubt about what the colleges do, how their programs follow from the programs of study of secondary schools, and how they prepare preuniversity students for university studies. There is also a good deal of uncertainty regarding the system's ability to train citizens who can contribute to Québec's society and function in a world order that is increasingly focused on knowledge and technological innovation. Finally, the fulfillment of its mandate to provide secondary school graduates with access to general training aimed at developing a critical sense, the ability to analyze and synthesize, and the ability to think creatively has never been documented (Henchey & Burgess, 1987).

Educational reform at the Cégep level began in the Province of Québec with a restructuring of the Social Science Program. In an effort to make the program more rigorous and coherent, and to adequately prepare students for university studies, a new core curriculum for the Social Sciences was established in the Fall of 1991. More stringent program requirements as well as two new compulsory courses, Quantitative Methods and Research Methods, form the basis of the new curriculum. The intent of these new courses is to provide students with a methodological framework that can be applied in any Social Science discipline. Both courses present a curriculum that requires students to demonstrate a broad disciplinary knowledge base, and to utilize it to solve complex problems. The inclusion of these courses in the Social Science curriculum is integral to the achievement of the program's main objectives which are to develop in students: (a) a rigorous thought process, (b) an understanding of the fundamental concepts and methods particular to the Social Sciences, (c) the ability to use the vocabulary of the Social Sciences to produce clear and correct discourse appropriate to the discipline, and (d) the ability to apply the fundamental concepts and basic techniques of applied quantitative and qualitative methods to a scientific research project in the Social Sciences (Conseil des Collegès, 1989, 1990).

The changes in the Social Science program were the first step in the current restructuring of the entire Cégep system. Public hearings on the future of college education in Québec were held by the Committee on Education from November 4 to December 18, 1992. The educational reforms that emerged subsequent to these hearings were based on 12 main recommendations, three of which are particularly pertinent to the work done in this project. The first one calls for the component of general education common to all programs to be updated and enhanced by defining common objectives and emphasizing the command of one's mother tongue. The second suggests that greater emphasis be placed on student guidance and supervision between secondary school and college through reception and integration mechanisms that provide direction, support and a stronger feeling of belonging for incoming students. Finally, it was recommended that preuniversity programs redefine and create clearer program objectives. The purpose of redefining program objectives is to: (a) provide learning goals that are more appropriately designed to be the first stage in a five-year program, and (b) ensure that various programs are of comparable "weight".

Despite the demands for quality and a genuine concern for academic excellence, few individuals or institutions have taken the time to define excellence in postsecondary education (Astin, 1985). In the United States, universities and colleges have traditionally been judged by physical or quantitative variables such as size, cost of physical plant, number of books in the library, retention rates and research publications (Halpern, 1987). In Canada, provinces have assessed quality in terms of attrition rates, placement of graduates, and student performance. Rarely have attempts been made to evaluate college on the basis of cognitive or affective changes which result from the participation of learners in college environments (Dennison, 1986). Emphasizing outcomes, however, requires that traditional measures of quality be replaced by new indicators of such changes. The National Institute of Education report, *Involvement in Learning* (1984), for example, encourages postsecondary institutions to replace proxy measures of educational excellence with evidence that "demonstrable improvements in student knowledge, capacities, skills, and attitudes" take place between beginning and completing college. However, there is little agreement about the meaning of a college education or what actually constitutes excellence; in fact, there is little agreement on abilities that entering students should have (Boyer & Levine, 1981; Skolnick, Marcotte, & Sharples, 1985; Turnball, 1985).

One way to address educational quality in terms of student learning is through outcome-based education (Spady, 1988; Spady & Marshall, 1991), also referred to as competency-based or abilities based education. Instead of evaluating excellence in terms of variables unrelated to learning, outcomes assessment measures the differences between entry and exit characteristics or competencies of students. Once desirable student outcomes are identified, all educational practices are keyed to these outcomes, and educators are held accountable for achieving them. According to Spady (1988), an outcomes-based approach to school improvement requires: (a) a relentless focus on outcomes as a driver for the educational program; (b) expanded opportunities and support for students to achieve these outcomes; and (c) high expectations for students, frequently stated as the "success for all" claim. In this approach, outcomes aimed at equipping students for success in a complex, challenging, high-tech future are first defined. Then the entire curriculum is redesigned into coherent, thematic programs, courses and units that support the outcomes. Finally, instructional and assessment practices are brought into alignment with the outcomes and curriculum.

New Conceptions of Teaching and Learning

The focus on teaching abilities and assessing student outcomes as the way to ensure quality education stems from changing theoretical views about what learning is, who is capable of it, and who is responsible for it. During the first half of the present century, much research on learning was done within the behavioral tradition of psychology. A behavioral conception of learning is that learning is a matter of acquiring the correct responses to certain situations. When these responses are practiced over time, a change in behavior results. Knowledge is viewed as a commodity to be passed from one entity to another. In this transmissionist view of learning, the role of the teacher is to tell the student what to learn; the role of the student is to passively receive the information.

During the late 1960s and early 1970s, theories of learning shifted from a behaviorist to a cognitive or constructivist orientation. In a cognitive conception of learning, learning is viewed as the acquisition of knowledge structures and skills rather than the acquisition of behaviors. Learning results in a discrete change between states of knowledge or mental structures, rather than a change in the probability of a response (Greeno, 1980). Changes in mental structure may lead to changes in behavior, but the changes in behavior are not what is learned, but rather the result of learning. The recognition of the essential uniqueness of each person's cognitive structure (Ausubel, Novak, & Hanesian, 1978) is central to a cognitive approach and explains why understanding is so dependent on what a person already knows. Abstract concepts emerge from a set of experiences which are only partially shared by others. Learning thus becomes a matter of each individual having to integrate their understanding of a new concept or idea with what they already know.

In this constructivist-cognitive approach, effective instruction is not a matter of providing information, but the facilitation of the learner's ability to construct meaning from experience (Wittrock, 1978). The student becomes an active constructor of knowledge rather than a passive receiver of knowledge (Resnick, 1984); the teacher designs the context, conditions and opportunities for students to interact with the content. Therefore, the teacher and student jointly construct academic knowledge; they jointly attempt to construct meaning. From this perspective, instruction begins with an understanding of the learners' abilities at the beginning of the learning process, an understanding of the cognitive processes demanded of each academic or learning task, and an understanding of the expected outcomes of the learning.

The Learning Task

Traditionally, classroom learning has been examined in relation to the general characteristics of teachers or instructional programs such as the amount of praise, the frequency and types of questions, time spent lecturing, and ways of providing feedback and reinforcement. Current research has expanded to include studies on student perceptions and behavior in classrooms as well as the cognitive operations involved in learning the school curriculum (Doyle, 1983; Levine & Wang, 1982; Ramsden, 1992). In broad terms, a curriculum can be viewed as a collection of academic or learning tasks (Doyle, 1983; Ramsden, 1992). According to Doyle, (1983), the term "task" refers to three aspects of students' work: (a) the products students are to create, such as an original essay or answers to a set of test questions; (b) the operations that are to be used to generate the product, such as memorizing a list of words or classifying examples of a concept; and (c) the resources available to students while they are generating a product, such as a model of a finished essay supplied by the teacher or a fellow student. In other words, academic tasks are defined by the answers students are required to produce and the routes that can be used to obtain these answers. Academic tasks are sometimes referred to as learning tasks or learning activities.*

The content knowledge and intellectual abilities acquired by students is directly related to the learning task set by the teacher. The task influences how students will approach or go about their learning. How a student 'approaches' a task describes a qualitative aspect of learning. This approach is about how the student experiences and organizes the subject matter of a learning task; it is about 'what' and 'how' they learn, rather than 'how much' they remember (Ramsden, 1992, p. 40). The way in which anyone goes about learning is a relation between the person and the material being learned. In other words, different students may approach the learning task in different ways.

Martin and Saljo (1976) described two different ways that a student might approach a learning task: a surface approach and a deep approach. Students who take a surface approach are motivated by extrinsic factors such as obtaining a job, keeping out of trouble or obtaining a certain grade. The main strategy underlying this approach is to avoid failure without working too hard. Students taking a surface approach view the task as a demand to be met and focus only on its concrete aspects. Therefore, the components of the task and the reasons for completing it are seen as unrelated to each other or to other tasks. Surface approaches lead to the ability to retain unrelated details, often for a short period of time. In contrast, a deep approach is based on interest in the subject matter of the task. The strategy is to maximize understanding so that curiosity is satisfied. Biggs describes a deep approach in the following way, "A student adopting a deep approach sees the task as interesting and personally involving, and focuses on underlying meaning rather than on the literal aspects.

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*Throughout this report we use 'task' synonymously with the French term 'activité d'apprentissage' which has unfortunately been translated in the English network as 'learning activity' rather than learning task.

The task components are integrated with each other and with other tasks. The student reads widely, discusses with others, and may 'play' with the task, theorizing about it and forming hypotheses about how it relates to other known or interesting items" (Biggs, 1991, p. 39). Deep approaches generate high quality, well-structured, complex outcomes; they produce a sense of enjoyment in learning and commitment to the subject. It seems, then, that if the student's intention (to understand or reproduce) interacts with the process of studying (to maintain the structure of the subject matter of the learning task, or to distort it) and determines the quality of understanding reached, an important challenge facing the college educator is to create learning tasks that foster deep understanding of academic subject matter.

The effect of the learning task on a student's approach to learning is increased dramatically when the learning task becomes an assessment task. After reviewing over two hundred studies on the impact of classroom evaluation practices on students, Crooks (1988) concluded that classroom evaluation affects student learning by suggesting what to learn, how to learn it, and what kind of effort should be put into the learning. For example, if the quiz, test, exam or assignment focuses on factual information, the student will learn to memorize; if the assessment task requires critical reading and analytical thinking, the student will learn to read critically and think analytically. The approach to learning taken by the student is thus largely determined by the assessment task set by the teacher. The task, in turn, determines the outcome of learning in that student learning will often match the cognitive demands of the task (Frederiksen, 1984; Milton, 1982; Newble & Jaeger, 1983). Therefore, if the cognitive demands of the assessment task determine the outcomes of learning, assessment tasks need to be closely linked to the goals of instruction (Crooks, 1988; Loacker & Jensen, 1988; Nickerson, 1987, 1989; Resnick & Resnick, 1985).

The goals of postsecondary instruction have always been complex; therefore, before teachers can design appropriate learning tasks and assessment tasks, they must be able to specify what the expected goals or learning outcomes are. Astin (1974) developed a taxonomy of college student outcomes based on the cognitive and affective domains (Bloom, 1956).

Cognitive outcomes are concerned with higher-level intellectual processes such as knowledge acquisition, logical analysis, synthesis and reasoning, while affective outcomes are concerned with attitudes, values, self-concepts, aspirations and approaches to learning. Bowen (1977) extended Astin's taxonomy and divided specific educational goals into two groups: goals for individual students and goals for society. The five categories of goals for individual students include: cognitive learning, emotional and moral development, practical competence, direct satisfaction from college education, and avoidance of negative outcomes. There are many other taxonomies in the literature that can be referred to as educators discuss their common intentions in teaching (Biggs & Collis, 1982; Bloom, 1956; Donald, 1985; Miller, Williams, & Haladyna, 1978). Although most abilities are common to all disciplines, it has been suggested that some abilities or ways of using an ability are unique to a discipline (Donald, 1985). Therefore, the first challenge for the Cégep teacher is to translate, adjust, and/or expand these taxonomies into clearly stated abilities that are meaningful, teachable and measurable.

New conceptions of teaching and learning require that the teacher look at a course, not only as a body of material for students to learn, but also as a set of abilities which students should be able to demonstrate or perform upon completion of instruction. In the past, many methods of didactic education assumed a separation between knowing and doing. Knowledge was treated as an integral, self-sufficient substance, theoretically independent of the situations in which it was learned and used. The primary role of schools was to transfer this substance, which was usually comprised of abstract, formal concepts. The activity and context in which learning took place were thus regarded as pedagogically useful, but fundamentally distinct and even neutral with respect to what was learned. Recent investigations of learning, however, challenge this separating of what is learned from how it is learned and used (Brown, Collins, & Duguid, 1989).

A growing number of researchers and educators are arguing that learning and the assessment of learning (Wiggins, 1989) must be situated in authentic tasks for knowledge to be useful and subsequently transferred to similar situations. Authentic tasks and/or authentic assessments are those "coherent, meaningful, and purposeful activities" within which knowledge and abilities are embedded (Brown, et al., 1989). Transfer of specific abilities and knowledge appears to take place under two conditions: (1) with much practice, in a large variety of situations, leading to a high level of mastery and near-automaticity, or (2) with deliberate, effortful abstraction of a principle (Perkins & Salomon, 1989). It seems, then, that students will not passively acquire complex abilities as a by-product of the acquisition of content knowledge, nor will they automatically transfer abilities learned in one discipline to another. Therefore, it is necessary to create a curriculum that is intentionally designed to integrate the acquisition of content knowledge with the simultaneous development of complex intellectual abilities.

The complex abilities required for successful postsecondary studies revolve around the ability to read academic texts and write academic discourse. In turn, the ability to read thoughtfully and write effectively is mitigated by the student's own knowledge of the learning process and how they, themselves, function as learners. Recent research in these three areas suggests that the reading, writing and metacognitive abilities required for successful learning at the postsecondary level are more complex than was previously thought.

Reading

Comprehension has been the focus of research in reading. The aim of this research has been to understand the internal processes involved in reading, that is, what the reader does while reading. The view of comprehension as a process of getting meaning from a text has been revised so that comprehension is now considered to be an interactive process, a process of bringing meaning to a text (Kintsch & van Dijk, 1978; LaBerge & Samuels, 1974; Ruddell & Speaker, 1985; Rumelhart, 1980, 1985; Samuels, 1985). The theory of reading as an interactive process posits that reading is influenced by processing speed, prior knowledge of the subject matter and metacognitive processes and strategies.

Comprehension is affected by the speed at which information is processed. At the college level this requires that both basic and complex reading skills be at an automatic level. It is assumed that college students arrive at college with efficient decoding skills. Recent research, however, indicates that the more complex aspects of reading, understanding word meanings, selecting relevant information, noting relationships, recognizing assumptions, drawing conclusions, and judging the validity of arguments, may not be fully developed (Bateman, 1990).

College reading tasks require two types of reading: reading for meaning (comprehension) and reading for remembering (studying). Both types of reading are influenced by the student's metacognitive status, that is, the degree of awareness and control students have over their learning activities (Baker & Brown, 1984). According to Brown (1980), some of the metacognitive skills involved in reading are: (a) clarifying the purposes of reading, that is, understanding the explicit and implicit task demands; (b) identifying the important aspects of a message; (c) focusing attention on major content, rather than trivia; (d) monitoring ongoing activities to determine whether comprehension is occurring; (e) engaging in self-questioning to determine whether goals are being achieved; and (f) taking corrective action when comprehension fails.

Writing

Cognitive psychology has also offered new insights into the process of composition. In the past, writing was viewed as a linear process consisting of a series of sequential steps or stages: prewriting, writing and editing (Rohman, 1965; Rohman & Wlecke, 1965; Sommers, 1978). These linear models focused on the product of writing and paid little attention to the cognitive and affective processes involved in a writing task. In contrast, cognitive models of writing view it as an interactive, recursive, problem-solving activity and attempt to describe the cognitive and affective processes that are activated when someone writes (Bracewell, Frederiksen, & Frederiksen, 1982; Flower & Hayes, 1980a, 1980b; Scardamalia & Bereiter, 1985).

College writing requires the transformation of knowledge, a process based on high order thinking abilities and self-regulatory strategies. The writer has to integrate planning, purpose, information about audience response, and knowledge of the topic into writing that has clear reference, explicit relations, organized content, and correct grammar and spelling (Flower & Hayes, 1984). The main parts of the composing process are planning, translating and reviewing. Planning is made up of generating, organizing and goal-setting subprocesses. The writer must generate and organize information, and set goals regarding how and when the writing task will be completed. The translating process (the actual production of text) requires the translation of knowledge stored in long-term memory into meaningful prose. The reviewing process consists of reading and editing until the writer is satisfied that the intended meaning has been communicated and that conventional standards of competency in writing have been met.

The demands of college writing tasks are more complex than the demands of writing in previous levels of schooling. The college writer must integrate and transform knowledge into a highly conceptualized and precisely related knowledge network and then translate this network into effective written text. It seems, then, that many entering students may not yet have developed the unique writing abilities required for college writing tasks, and that college is an appropriate place to develop them.

Metacognition

Although most students have adequate intellectual ability, intent to learn, and a goal for the future, they often find that they do not have the cognitive abilities required to complete college level tasks (Dansereau, 1978; Roueche & Snow, 1977; Weinstein & Mayer, 1986). They have difficulties with listening, speaking, reading, writing and thinking analytically. They have an inadequate understanding of the amount of work necessary for success and do not know how to study, take notes or manage their time. They lack metacognition; that is, they lack the ability to reflect about oneself as a learner and to control one's own learning process (Weinstein, 1988). In order to use these reading and writing strategies, college students must possess a good deal of knowledge about themselves as learners, knowledge of the task and what is required, and knowledge of the text and how to use it. The ability to reflect on one's own cognitive processes, that is, to be aware of one's own activities while reading and writing, is a late-developing skill and demands a sophisticated learner (Baker & Brown, 1984). Research on metacognition, however, makes it clear that cognitive skills for comprehending and producing written text can be taught (Brown, 1980; Brown & Day, 1983; Palinscar & Brown, 1984). It is these processes of self-regulation that college students need to acquire in order to become independent learners.

Attrition and Persistence in Higher Education

Abilities based education and outcomes assessment that is based on meaningful learning, should help alleviate another problem facing college educators, administrators, parents and students, namely, the high rate of dropouts. Besides its budgetary effects, which can threaten the very existence of an institution, its social and educational implications are far reaching (Allan, Darling, Hughes, & Rosenfeld, 1983; Bean, 1980; Dennison & Gallagher, 1986; Ducharme, 1989; Holdaway & Kelloway, 1987; Tinto, 1975, 1982, 1986, 1987; Willner, 1970). Dropout as defined here involves "those situations in which there is failure on the part of both the individual and the institution, a failure of the student to achieve and of the institution to facilitate the achievement of reasonable and desired educational goals" (Tinto, 1985, p. 29). The decision to persist or drop out of college is determined by the ability of the student to adjust to college life and the ability of the institution to facilitate that adjustment.

The problem of adjusting to college life is magnified for Cégep students who enter a college environment one year earlier than their North American counterparts. Many students are inadequately prepared to complete college academic tasks. They often lack background knowledge and have difficulty with logical analysis, synthesis and critical judgment (Bateman, 1987; Ducharme, 1989). Studies indicate that 47% of the Québec population between 17 and 19 years old attend Cégep, but only 65% of these students finish their programs and receive their diploma (Ducharme, 1989; Noel. 1988). The 1987-1988 annual report of the Service régional des admissions du Montréal métropolitain stated that the situation since 1983 has continued to deteriorate; more than 40% of students entering in 1985 and 1986 did not receive their diploma (p. 10).

The problem of adjusting to the demands of college are particularly difficult for Social Science students. These students have historically been the largest subgroup of students who are at risk and the least committed to higher education (Bateman, 1987, 1990; Québec, Conseil des Collèges, 1988; Willner, 1970). Many underestimate the complex demands of college study and fail to see a connection between their studies and preparation for a future occupation. Bateman (1987) found that 44% of the students who entered Champlain College in 1985 and subsequently dropped out were Social Science students. This statistic was confirmed for the entire Cégep network in a report published by the Conseil des Collèges (1988) entitled *La réussite, les échecs et les abandons au collégial*; only 56.5% of students in the Social Sciences without mathematics successfully complete Cégep.

The incidence of student leaving is highest in the first year of studies (Beal & Noel, 1980; Bean, 1980; Ducharme, 1989; Conseil des Collèges, 1988, 1989; Holdaway & Kelloway, 1987; Tinto; 1988; Upcraft & Gardner, 1989; Cornell, et al., 1990). Perhaps this is because adolescents are at a particularly difficult developmental stage. First year college students are becoming independent, developing physical and intellectual competence, and developing interpersonal skills (Chickering, 1969). They must adjust to the cognitive and affective demands of college level tasks which are inherently different from the academic tasks required in high school (Bereiter & Scardamalia, 1983; 1985; Brown & Smiley, 1977; Scardamalia & Bereiter, 1986). In a study conducted at John Abbott College on *Easing the Transition*, the difficulty of this period is expressed by one student who dropped out of the first year of college: "*I didn't know how to be there*." Although this student possessed many characteristics of a successful college student, including an adequate high school preparation, his academic career was interrupted because he was unable to discover how to "be" a college student (Cornell, et al., 1990). Likewise, students who fell under the Régime Pédagogique's Regulation 33 (failed students seeking readmittance to the college) often cited an inability to cope with the collegial environment as the main reason for their failure.

Numerous studies on educational achievement factors have also identified individual characteristics associated with the individuals' interaction within the college setting that seem to be related to persistence in college. Important individual characteristics include: family background, general ability, attitudes toward learning, commitment to a goal and knowledge of learning strategies. Institutional characteristics include the quality and quantity of peer interactions, faculty-student interactions, and the quality of student learning.

The family's socioeconomic status appears to be inversely related to dropout (Astin, 1964; Eckland, 1964; Panos & Astin, 1968; Sewell & Shah, 1967). Children from lower status families exhibit higher rates of dropout than do children of higher status families even when intelligence has been taken into account (Sewell & Shah, 1967). At the college level, however, the students' own ability is even more important. Measures of ability as obtained on standardized tests (Pintrich et al., 1986) and ability as measured through grade performance in secondary school have been shown to be related to persistence in college (Astin, 1971; Blanchfield, 1971). Willner (1970) found that the largest percentage of determined persisters were those with high school averages between 70 and 89.

Attitudinal differences between college dropouts and college persisters have also been noted. Vaughan (1968) suggests that dropouts tend to be more impulsive than persisters; they lack any deep emotional commitment to education and are unable to profit as much from their past experiences. They are more unstable, anxious and restless when compared to their successful peers. Therefore, it is more difficult for them to reach the level of achievement required in the college setting (Weiner & Potepan, 1970). It has been found that dropouts view education as a practical necessity, while persisters are likely to value their college education as a process of gaining knowledge and of appreciating ideas (Bateman, 1987; Medsker & Trent, 1968). Another factor affecting attitude and motivation is academic self-esteem. This self-concept is conceived as students' self-evaluation of their academic capabilities and worth, built through prior experiences of success and failure at school (Van Overwalle, 1989). In two meta-analyses (Uguroglu & Walberg, 1979; Hansford & Hattie, 1982), an average correlation of .40 was found between academic self-concept and performance. Related to academic self-esteem is the student's locus of control (Rotter, 1966). This concept is conceived of as a personality disposition. Findley and Cooper (1983) documented a correlation between locus of control and achievement in college, indicating that individuals who feel personally responsible for things that happen to them (i.e., internals), typically achieve higher academic scores than those who believe that outcome in life is determined by external forces (i.e., externals).

Once the individual's ability is taken into account, research suggests that their commitment to the goal of completing college is most influential in determining college persistence (Astin, 1964; Sewell & Shah, 1967). Spaeth (1970) found that the entering plans of college graduates were a more important influence on ultimate career choice than their in-college grades. Willner (1970) found that students who intend to persist are often found in career programs such as Early Childhood Education, Nursing and Data Processing. Since "preparation for a career" is the most prevalent reason cited for going to college, it is not surprising that in his study, beginning liberal arts students contained the smallest percentage of students who intended to persist. Many liberal arts students fail to see any connection between their studies and preparation for a future occupation.

Persistence in college is, however, not the simple outcome of individual characteristics, attitudes toward learning and academic skills. Tinto (1975; 1982) argues that one must view attrition as the outcome of a longitudinal process of interactions between the individual and the institution (peers, faculty, administration) in which he or she is registered. Tinto (1988) expanded his model of student retention to include the concept of distinct stages—separation, transition, and incorporation—through which new students must typically pass during the course of their college careers. Using *The Rites of Passage* (Van Gennep) as a sociological framework, he equates the difficulties encountered by an individual moving from one group to membership in another, to the difficulties encountered by a high school student moving through college. Students must separate themselves, to some degree, from past associations in order to make the transition to eventual incorporation in the life of the college. They must acquire the norms and patterns of behavior appropriate to integration in the new community. As the student goes through these stages of separation and transition, he or she must simultaneously become socially and intellectually integrated into the college environment.

An institutional characteristic mitigating social integration is faculty-student interaction. Benezet (1981) speaks of the dual needs of students to find in the college a vehicle for cognitive development in the broadest sense, and a model of social interaction that will hearten them for the lifetime of organizations ahead. Detailed analysis of the impact of faculty on students in various types of institutions suggest that faculty contribute significantly to such development in students (Astin, 1977). Frequent interaction with faculty leads to greater interest in and commitment to intellectual concerns. Students who interact with faculty seem to develop a greater sense of personal and vocational identity, an increased ability to form close relationships and influence peers, and a predisposition to take advantage of campus opportunities (Wilson, 1975). Pascarella (1980) relates first year persistence/withdrawal decisions specifically to total frequency of student-faculty informal, nonclassroom contact, frequency of interactions with faculty to discuss intellectual matters, and quality of interactions. He concludes that with pre-enrollment differences among entering students held constant, measures of the frequency of student-faculty informal contact are significant and positively associated with first year academic performance, intellectual development, and personal development. In the final analysis, a student's satisfaction or dissatisfaction, success or failure, may depend more on the quality and interest of individual faculty members than any other factor (Carnegie Foundation, 1977).

Traditionally, colleges have been reactive rather than proactive in their response to poor academic achievement among students. Remedial programs that offer tuition in reading, writing, math and study skills are directed at the student who has already failed. In addition, these programs seldom address the emotional need of the student to belong to a community and identify with an institution. A review of the literature indicates that institutions can minimize the causes of poor academic performance and reduce the number of potentially successful students who leave school prematurely (Tinto, 1982).

A number of different approaches have been developed in North America during the past two decades to deal with the transition of students from high school to college (Boyer, 1987; Noel, et al., 1985; Roueche & Snow, 1977; Upcraft & Gardner, 1989). These efforts have included minicourses or workshops with various goals and formats (Eckstein, Eckstein, & Boatright, 1977; Gordon & Grites, 1984; Starnes, 1989; Weinstein, 1981); those designed to help students with their career planning (Barker, 1981; Bechtol, 1978) and others that include special publications, field days, and extended orientations. A complete review of this literature can be found in Noel, Levitz and Saluri, 1985.

In Québec, a number of programs have been initiated for incoming students (Brodeur, 1989; Starnes, 1989). At College St-Jean-sur-Richelieu and at Cégep de Rimouski a "programme d'accueil" of three core courses was offered to incoming students with a weak high school profile. At College St-Jean-sur-Richelieu students were obliged to enroll in these courses and at Cégep de Rimouski students were strongly advised to enroll in these courses. Brodeur (1989) reports that the compulsory registration at St-Jean-sur-Richelieu seemed to lead to motivation and discipline problems. Researchers at Cégep de Rimouski report that students, in this case, weak students, do not always recognize or accept that adjusting to college may require assistance.

The *Success-In-College-Project*, a project for review board students undertaken at Champlain Regional College, indicated that failing students can be taught the learning strategies and background knowledge necessary for completing college academic tasks successfully (Kerwin-Boudreau & Bateman, 1989). However, an important goal of this project, the transfer of abilities and skills across courses, was not realized because the teachers had to spend their research time dealing with the complex academic and personal problems of the students in the program.

This review of the literature suggests, then, that all first year students are at risk and that the goal of retention is achieved through improved programs and services to these students.

Conclusion

By far the most important characteristic of an institution that leads to persistence is the quality of learning it delivers to its students. The more students feel they are learning, the more they are likely to persist; and when student success and satisfaction is combined with learning, persistence is almost guaranteed. If learning is a qualitative change in the person's view of reality, then learning in educational institutions should be about changing the ways in which learners understand, or experience, or conceptualize the world around them. The 'world around them' includes the subject matter knowledge, and the ways of thinking and solving problems that are characteristic of the discipline or profession that they are studying. Cognitive conceptions of learning clearly state that students will not acquire the ways of thinking and solving problems that are characteristic of the discipline as a by-product of the acquisition of content knowledge. Nor will they automatically transfer abilities learned in one discipline to another. The quality of student learning can dramatically increase when the curriculum is intentionally designed to integrate the acquisition of content knowledge with the simultaneous development of complex intellectual abilities. One can conclude that as the quality of student learning increases in an institution, so will the persistence of its students.

Statement of Research Purpose

The objective of this research project, therefore, was to create and evaluate a program for incoming Social Science students that was deliberately designed to promote the intellectual and social integration of each student into the college environment. In the first and second year of the project, teacher-researchers identified abilities that are associated with successful learning in the Social Sciences, and designed specific learning tasks that were used to both teach and assess these abilities. The objective of the third year was to operate and evaluate the project with the abilities based curriculum and assessment measures in place.

The specific goals of the project were to:

1. identify the abilities needed by students to complete a DEC in Social Science
2. create criteria or descriptive statements that gave a picture of each ability
3. determine how these abilities can be taught
4. create learning/assessment tasks to teach and assess these abilities
5. promote student/faculty interaction
6. enable students to assume responsibility for their own learning
7. increase each student's ability to communicate (read, write, speak, listen)
8. develop each student's ability to think analytically

Hypothesis

Based on the assumption that the forces that influence attrition during the first year of college are qualitatively different from those that influence attrition in the latter years of college, it was hypothesized that incoming Social Science students can acquire the academic skills and learning strategies necessary for success if they are provided with a program that is intentionally designed to (1) encourage peer interaction, (2) encourage faculty-student interaction, and (3) improve student learning. Students who avail themselves of this transitional program, when compared to students who do not, would demonstrate:

1. a higher level of competence in the abilities identified by the faculty team as being crucial to success in college
2. a stronger academic persistence profile
3. a stronger commitment to the institution
4. a more positive attitude toward education as a process of gaining knowledge and assimilating new ideas
5. a better understanding of and commitment to the Social Sciences

Two

PROJECT DESIGN AND CURRICULUM DEVELOPMENT

Establishing the Project: 1991-1992

In the Spring of 1991 all students admitted into the Social Science and Commerce* programs received a brochure describing the *OMEGA Project* (the local name for the transitional project) inviting them to join. Admission into the project was voluntary and on a first-come first-served basis. The first 60 students who applied for admission into the project were then invited to an information session that was held on July 30, 1991. Fifty-six of these students subsequently enrolled allowing for two classes of mixed Social Science and Commerce students to be formed. The *OMEGA* course offerings were as follows:

Fall	Winter
Introduction to Literary Concepts	Contemporary Ideas in Literature
Political Regimes and Ideologies	International Politics
Psychology of Learning	Developmental Psychology
Hiking and Camping	

All *OMEGA* students carried a normal course load. However, to promote peer interaction and to establish a sense of belonging to the college, the students in the project attended four *OMEGA* courses in their first semester and three in the second semester as intact groups. To promote faculty-student interaction and to ease the transition, students were taught by the same teachers in both semesters. However, to reduce group dependency and to facilitate their integration into college life as a whole, it was decided to give students the freedom to choose a Physical Education course in the second semester.

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* At Champlain Regional College, incoming Social Science students are divided into two groups: Social Science students who do not study Math (300) and Social Science Students who study Math (400). Social Science students who study Math are known as Commerce students and are referred to as such throughout this report.

Curriculum Development

In the summer of 1991, the project coordinator and the four *OMEGA* teachers met a number of times to design the integrated abilities based curriculum. Guided by the literature on outcomes-based education and the principles of cognitive psychology, we designed our initial curriculum model by first selecting three broad abilities as crucial to success in college.

Independent Learning

We saw this ability as encompassing metacognitive awareness and effective application of appropriate learning strategies. An important cognitive outcome would be an increase in deep level processing; that is, a decreased dependence on rote memorization and an increased attempt to broaden understanding, make connections and develop insights.

Communication

Increased competence in the four components of this ability: reading, writing, speaking and listening, we saw as crucial to success in college. Without the ability to read and listen actively and purposefully and to speak and write coherently and logically, students are unable to perform those tasks which form the basis of their curriculum. Moreover, theories of cognitive development suggest that language ability is inextricably linked to the achievement of higher cognitive processes. Therefore many complex cognitive outcomes result from the development of this ability: mastery of the vocabulary of the discipline, mastery of various rhetorical modes, comprehension of academic discourse and production of academic discourse.

Analytical Thinking

Given the aims of the new Social Science program, it seemed clear that one of the primary objectives of the project curriculum should be the development of those higher order thinking abilities which would result in the cognitive outcomes required to succeed in the program: understanding the concepts and methods particular to the Social Sciences, applying those concepts and methods and acquiring an interdisciplinary methodological framework. Important affective outcomes would include increased commitment to the program and increased academic persistence.

Developing Objectives and Harmonized Course Plans

Having selected the abilities, we then produced course plans which were consistent with the abilities based approach and integrated nature of the *OMEGA* curriculum. All course plans began by formulating the four broad abilities that the project aimed to develop. The terminology and structure that each separate course plan adopted was the result of collaboration and agreement among all project teachers.

Communication objectives for the English course were defined in a fairly conventional manner: first, by describing the process that students should be able to perform in order to produce discourse; and then, by describing the components which make up what is generally known as academic discourse, or argument. The Psychology of Learning course listed as objectives those strategies which lead to independent learning. Objectives of the Hiking and Camping course included use of both learning strategies and communication abilities in a practical problem solving context.

Formulating objectives for Political Science, however, was a more complex task. Since the primary purpose of this course was to develop the student's cognitive abilities, it was important to define the levels of higher order thinking that the course content would help the student attain. To assist us in the formulation of these objectives, we consulted Bloom's taxonomy of educational objectives in the cognitive domain. Bloom defines six levels of cognition functioning which are sequenced hierarchically: knowledge, comprehension, application, analysis, synthesis, and evaluation. For each level, Bloom provides key words which can be used to describe the ability as an educational objective. Although Bloom's hierarchy has been criticized for implying that a clear separation can be made between levels and that development takes place in a linear fashion, we, nevertheless, found the taxonomy to be a useful tool for transforming subject matter objectives into cognitive development objectives. The taxonomy was particularly helpful in determining how the content knowledge transmitted in courses like Psychology and Political Science could be used to develop cognitive abilities. It also proved helpful in formulating analytical reading objectives. Moreover, the taxonomy provided a suitable framework within which to define the cognitive abilities that students would need to acquire in order to achieve the outcomes of the new Social Science program.

Designing the Integrated Model

Each course was then designed to transmit and reinforce the abilities. It was decided that each teacher would take on the primary responsibility for teaching one ability, while others would be assigned the responsibility for reinforcing abilities. In this way transference of abilities from one context to another would be encouraged. At the same time, it minimized the danger that students would see their *OMEGA* courses as repetitive and reassured teachers that they would have time to teach new content knowledge related to their disciplines.

For example, the Psychology of Learning course was designed to provide instruction in learning strategies needed to develop independent learning: goal setting, time management, note taking and textbook reading. The English and Political Science teachers reinforced these abilities by creating learning tasks which required students to use the library, read texts, take notes and schedule their time. The Hiking and Camping course was especially designed to promote group interaction in a learning situation outside the classroom. At the same time it reinforced learning strategies by requiring students to put both goal setting and time management to practical use by planning a trip and scheduling activities.

Group dynamics theory was taught in both the Physical Education course and in the English course, and students were required to work in groups in all four courses. The English course focused primarily on essay writing, documentation techniques and analytical and critical reading. These abilities were reinforced throughout the courses by requiring students to produce discourse based on library research and textbook reading.

Analytical thinking was taught primarily in the Political Science course where students were expected to analyze various political regimes using the theory of comparative politics. Reinforcement took place in other courses by requiring students to analyze the process of learning and their group's development. A very strong reinforcement was provided in the English course where students were required to read analytically and to render the results of their analyses in essay form.

Courses in the second term were designed both to reinforce abilities learned in the first semester and to present students with more complex learning tasks within the same discipline.

Designing Cross-Disciplinary Learning and Assessment Tasks

In order to encourage transference of abilities, a number of cross-disciplinary tasks were designed. Group dynamics theory taught in the English and Physical Education courses was applied on the Hiking and Camping weekend and students' understanding of the theory and their ability to communicate that understanding were assessed by both teachers by means of a major writing assignment. Oral communication assessment tasks were designed and integrated into both Political Science and Psychology of Learning courses and abilities were assessed by both teachers. The Political Science and English teachers designed a research paper to teach and assess reading, writing and analytical thinking abilities.

Promoting Faculty-Student Interaction

In accordance with research which links first year persistence with frequency of student-faculty informal nonclassroom contact, a mentoring system was set up to promote teacher-student interaction. Each teacher took on the responsibility to make contact with 12 to 14 students on an individual basis from time to time during the semester. Project teachers encouraged students to discuss their academic performance and to assess their personal and intellectual development. These informal sessions were also used to reinforce learning strategies and commitment to the Social Sciences. Teachers also joined students on the Hiking and Camping weekend which represented the major learning activity of their Physical Education course.

Each student was also given, early in the first term, the results of the student development measures in an individual interview either with the coordinator or one of the project teachers. As a result, each student had by mid-term a profile of him- or herself as a learner, as a writer, and as a reader. These interviews, we believed, would enable students to assume responsibility for their own learning and help them deal with patterns of self-defeat and sources of anxiety. To encourage retention of learning and transference of abilities into the second semester, individual student interviews were set up at the beginning of the second semester to review first term assignments and to evaluate student progress. In addition, students were given a great deal of individual assistance with learning tasks during teacher office hours in both semesters.

Coordinating the Project

In order to maintain the integration of the curriculum, a weekly one hour meeting period was scheduled. The meetings were used to plan reinforcement techniques, coordinate assessment tasks and monitor the progress of students throughout the term. Between semesters and at the end of each year of operation, a number of one day meetings were devoted to evaluating and modifying the curriculum, defining criteria and developing improved assessments.

In addition to providing a context for self and peer evaluation which increased teacher effectiveness, the meetings also had important effects on *OMEGA* students. The integrated nature of the curriculum became tangible for them since their teachers were always aware of their progress in all their *OMEGA* courses and knew exactly what transpired in each course. They also perceived the project teachers as interested and committed to their development which increased their satisfaction with the institution.

Each teacher also maintained a weekly journal, copies of which were distributed to all members of the project. The journals were used to define the content knowledge introduced in each class, to identify the abilities that each class activity sought to develop and to determine the learning strategies students required to achieve mastery. The journal acted both as a primary data source for the research and as a vehicle for developing a common vocabulary. During the teaching term it was also used to monitor the coherence of the *OMEGA* curriculum. By examining each weekly entry, for example, the project teachers could ensure that the communication abilities being developed in the English course were being reinforced through learning tasks in other courses; or, that the learning strategies being taught were appropriate for the tasks assigned.

Evaluation and Modification

Throughout the semester, student evaluation of the project was conducted by the project coordinator through general meetings with students, a written student evaluation administered in January 1992, and individual interviews. Teacher evaluation of the project was an ongoing process which took place during the weekly meetings. The results of evaluation led to a number of modifications to the project in the second year.

Feedback from the students indicated that the *OMEGA* curriculum should consist of required or ministerial courses. The package of courses that was offered to them during the first year of the project limited their choice of complementary courses. In addition, when the transitional project was first conceived, the new Social Science program was not yet fully implemented. Thus the 1991-1992 course offerings did not take into consideration the new Social Science profile that the students would be required to maintain.

Students also reported that a 45 hour course on learning strategies was unnecessarily lengthy, given the amount of reinforcement of these strategies they obtained in the other *OMEGA* courses. They also indicated that two courses in Political Science placed too much focus on one discipline area and they suggested that the *OMEGA* package should include a Humanities course in the second term which would both keep students on profile and allow them to complete one of their core courses as part of *OMEGA*. On the other hand, students were enthusiastic about the Physical Education course, Hiking and Camping, and recommended that a similar course be included in the second term for the next group of *OMEGA* students.

Accordingly, when we planned the 1992-1993 curriculum, Quantitative Methods and Introduction to Psychology were added to the first semester and Psychology of Learning was eliminated while Introduction to Methodology and Humanities were added to the second semester. We planned a number of special seminars to present the principles of learning originally covered in the Psychology of Learning course.

Teacher evaluation of the project also led to modification of the formal mentoring program set up in the first year. It seemed clear that students were capable of selecting their own mentors from among the *OMEGA* teachers and that the formal assigning of students to teachers was quite unnecessary and, indeed, interfered with students' natural impulses to talk. Therefore, in the second year of the project we eliminated the formal mentoring system to allow students to initiate contact with a teacher (or teachers) of their choice. Teachers would initiate contact only with students who appeared to be withdrawn or isolated.

The progress of curriculum development was also reviewed and re-evaluated. Although our research proposal had presented a time frame of research activities which suggested that the development of the curriculum could advance in an orderly linear fashion, in practice this would not be possible. In the first year of operation, for example, teachers were confronted with a task of considerable complexity. We had to develop an integrated abilities based model which we could operate within a course structured curriculum. Moreover, to accomplish this goal, we had to transform courses which were originally designed to transmit content as knowledge structures into active learning experiences which would develop abilities while, simultaneously, identifying those abilities and teaching learning strategies. In addition, although the projected time frame of our research required us only by the second year of operation to have developed performance based assessment tasks, our first year *OMEGA* students had to be assessed; and, in accordance with the terms of Champlain's Student Evaluation Policy, both the schedule and the nature of those assessments had to be included in our course plans. Therefore, assessment tasks which reflected the new orientation of our courses had to be designed, in effect, before the courses were reoriented. Finally, we had to modify our project design in order to adapt to a Social Science program which was itself undergoing modification. Thus we concluded that conforming to established institutional policies while adjusting to evolving structures would have a significant impact on curriculum development processes over the next two years.

Overall, both public and student response to the project was extremely positive. Feedback that we received from the community, particularly from guidance counselors at our feeder schools, suggested that the demand for admittance into the *OMEGA Project* for 1992-1993 would increase.

Operating the Project: 1992-1993

In the Spring of 1992 a brochure was sent to all students admitted into the Social Science and Commerce programs for the Fall 1992 semester describing the modified *OMEGA Project* and inviting them to apply. The course offerings were as follows:

Fall	**Winter**
Introduction to Literary Concepts	Contemporary Ideas in Literature
Political Regimes and Ideologies	Introduction to Research Methods
Introduction to Psychology	Humanities
Quantitative Methods	Physical Education
Hiking and Camping	

Seventy-nine students applied for admission and, after an information session held on August 6, 1992, 60 students enrolled in the *OMEGA Project*. However, whereas in the first year of operation we were able to create two classes of mixed Social Science and Commerce students, in Fall 1992, we were forced to place Commerce and Social Science students in separate classes. This reorganization of students affected the educational environment created in the two *OMEGA* classrooms. Moreover, changes in the *OMEGA* course offerings affected student achievement, the group dynamic in the classrooms, and the work of the research team.

Effect of Separating Commerce and Social Science Students

The system used at Champlain to integrate the new Social Science program required that Commerce students take Quantitative Methods in the Math Department, while Social Science students who do not take math take Quantitative Methods in the Social Science Department. Consequently, *OMEGA* Commerce students were put into a separate group for this course and thus became an intact group for all their *OMEGA* courses. As a result, *OMEGA* Social Science students also became an intact group.

Each group of students presented different characteristics in their degree of commitment to a college education, their attitude towards academic work, their ability to complete assignments and in their ability to work in groups. The project teachers described the Commerce students as very career oriented. Their career goals included going to university and getting a job in business. They were less interested in the process of learning than in the grades they could achieve by completing the learning tasks. Therefore, although most of these students complained bitterly about the amount of work they had to do—complaining which created a high level of anxiety in the classroom—their work was usually completed on time. They were also described as being very individualistic, competitive and teacher dependent, characteristics which made it difficult for them to work with their peers in a group.

In contrast, Social Science students were less career oriented. They did not see a direct link between their studies and a future career. However, they appeared to be more engaged in the learning process, were much less competitive, and seemed to regard the personal interactions involved in the learning process as more important than the grade they might receive. Their ability to share with each other made them less teacher dependent and more able to work collaboratively in groups. Therefore they complained less about the amount of academic work required of them but, unfortunately, they were also less concerned about deadlines and the consequences of incomplete assignments.

Therefore, as a group, Commerce students were more successful in completing the first term than the Social Science students. Most Commerce students passed all of their courses while more than half of the Social Science students did not.

Effect of Changes in OMEGA Course Offerings

Our decision to add Quantitative Methods and Introduction to Methodology to the *OMEGA* course package and to substitute Introduction to Psychology for the Psychology of Learning course materially altered the operation of the project in the second year.

The failure rate of Social Science students in the first semester had serious consequences for the research project in the second semester. Since Champlain College considers Quantitative Methods to be a prerequisite for Introduction to Methodology, less than half of the *OMEGA* Social Science students were qualified to take Methodology in the second semester. By and large, the same group of students who failed Quantitative Methods also failed their English course, often by simply neglecting to hand in required writing assignments. Although English courses are not formally sequenced, it seemed clear that those students who had not completed the writing tasks which represent the learning tasks for the first semester course would be unprepared to successfully complete the more complex tasks planned for the second semester. Therefore those students were recommended to register for a non-*OMEGA* English composition course in their second semester. Thus the *OMEGA* Social Science group was reduced by half in the second semester.

The addition of a fifth course to the first semester also affected our plans to offer a 10 hour seminar on learning strategies in that it became extremely difficult to schedule a block of time where all *OMEGA* students were available. Therefore we decided that all teachers would take on the responsibility to both introduce and reinforce the learning strategies in their courses. However, although we did our best to introduce the strategies, the vocabulary that we used was not consistent. Without the consistent use of a common vocabulary, the conscious (metacognitive) awareness of the usefulness of these strategies did not appear to develop in the students.

The additional courses in the 1992-1993 *OMEGA* package also created major scheduling problems in the second semester. In the first year of the project we offered four *OMEGA* courses in the first semester and three in the second. In the second year of the project we offered five courses in the first semester and planned to offer four in the second. Unfortunately, the logistical difficulties involved in maintaining two intact classes in four courses in the Winter proved to be insurmountable. As a result, we were forced to change our plans to offer a second Physical Education course and a Humanities course as part of the

OMEGA package. *OMEGA* students, however, having taken more than half of their first semester courses in intact classes, were more relieved than distressed by the change in plans.

Curriculum Development

Modification of the project design had considerable impact on curriculum development and research activities in the second year of operation. Adding Quantitative Methods enlarged the team and extended the task of ability identification into a new area. The impact was compounded by the fact that the two QM teachers came from different discipline areas, mathematics and sociology. Thus they approached the content from two quite different perspectives and, consequently, used different criteria in their assessment tasks, and identified different abilities as necessary for success. The mathematics teacher, for example, approached Quantitative Methods as an introduction to statistics and the Commerce students who took this course were expected to have background knowledge in mathematical concepts and to develop mathematical problem solving abilities. Conversely, it was not expected that Social Science students would have a background in mathematics nor that they would develop mathematical abilities. The Sociology teacher's objectives related more closely to those involved in analytical reading and communication; that is, how to read and evaluate numerical data and how to use numerical data to communicate information. Since the aim of the *OMEGA Project* was to create a curriculum for Social Science students who do not have a strong background in mathematics, we decided that the data provided by the Sociology teacher's journals would represent a more accurate reflection of the abilities these students would need to succeed. Performance criteria, therefore, was based on our analysis of Quantitative Methods as it would be taught to Social Science rather than to Commerce students.

Evaluation and Modification

The same evaluation process was followed as in the first year of the project. Both students and teachers agreed that students would be better able to deal with the demands of the Quantitative Methods course in the second semester. Likewise, there was agreement that taking five courses together in the first semester threatens to obviate the transitional nature of the project. Teachers experienced more classroom management problems than in the first year of the project and students reported that they found themselves socializing too much and working too little. Therefore we decided to retain Quantitative Methods as part of the *OMEGA* course package but to offer it in the second semester. We also decided to return to offering four courses in the first semester and to reduce the second semester course offerings to two. This course package, we believed, would resolve many of the difficulties we experienced in the second year of the project. It would eliminate scheduling problems in the second semester. It would promote enough, but not too much, peer interaction in the first semester and it would facilitate integration in the second semester.

Despite the fact that we appeared to have two distinct groups in the project, Commerce and Social Science, the project teachers decided that both groups of students should continue to be accepted. Commerce students could benefit from the emphasis on collaborative learning, while Social Science students could benefit from the emphasis on cognitive development and learning strategies. Both groups needed to develop their analytical thinking abilities. Moreover, the modified 1993-1994 course package would allow us to return to mixed classes in the first semester in which case each group might have positive effects on the other. Thus the high level of anxiety in the Commerce group might be moderated by the more relaxed attitude of the Social Science students. Likewise, underachieving Social Science students might benefit from the highly motivated attitude of the Commerce students.

A final decision was to give scheduling priority to the 10-hour seminar on learning strategies. We decided that this seminar should deal explicitly with the abilities that the project is trying to foster as well as the learning strategies that enhance the development of these abilities. Priority would also be given to developing the teachers' ability to use the common vocabulary when reinforcing these strategies.

Operating the Project: 1993-1994

As in the previous two years, all students admitted into the Social Science and Commerce programs were invited in May to join the *OMEGA* project. The course offerings were as follows:

Fall	**Winter**
Introduction to Literary Concepts	Contemporary Ideas in Literature
Introduction to Political Science[*]	Introduction to Quantitative Methods
Introduction to Psychology	
Hiking and Camping	

However, while in first two years of operation enough students applied for admission to allow for two sections of intact *OMEGA* classes, in 1993 we received only 33 applications. After the information session, 31 joined the *OMEGA Project*, allowing for one section of mixed Commerce and Social Science students. We attribute the decline in applications to the increased number of special preuniversity in-house programs that were offered to incoming Social Science and Commerce students in the same admissions package. Whereas in the first year of operation, *OMEGA* and Champlain's Liberal Arts program were the only in-house programs available to Social Science and Commerce students, in 1993 these students were offered five programs: the International Baccalaureate Diploma, Environmental Studies, World Studies, Liberal Arts and *OMEGA*.

Apart from the decline in student applications, the third year of operation was relatively problem free. Teachers reported that because learning tasks and performance criteria were established both teaching and assessment were easier in *OMEGA* courses than in other courses. The voluntary mentoring system worked well, with students initiating contact with teachers on an informal and relaxed basis. Although *OMEGA* Commerce students still competed with each other and Social Science students still had to be prodded to hand in assignments, the success rate of Social Science students was higher in the first semester and Commerce students did not exhibit as much anxiety over their grades. In fact, classroom management problems were minimal during the last year of the project and involved only one or two individual students, rather than the group as a whole.

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[*] Formerly, "Political Régimes and Ideologies."

The learning seminar was modified, however, in the final year. It was reduced to six hours and given by the project coordinator in three two hour sessions over a period of six weeks. The sessions were held during class time in three of the *OMEGA* courses. The teachers were present during the sessions and all made a point of using the common vocabulary as they reinforced the learning strategies. The seminar was closely followed by individual interviews with students to give them the results of the student development measures. This acted as a further reinforcement. As a result, students appeared to develop a higher level of metacognition than in the previous two years.

The course package developed for the final year of the project was evaluated by both teachers and students as a satisfactory transitional program. The four courses in the first semester gave students sufficient peer interaction and allowed them to develop a stable relationship with each other and their teachers. Placing Quantitative Methods in the second semester improved students' success rate in that course while the continuation of English into the second semester allowed students to consolidate both their writing and analytical thinking abilities in a familiar and stable classroom environment. By reducing the number of *OMEGA* courses to two in the second semester, students were weaned gradually from the project and were able to make a smooth transition to a normal college curriculum in their third semester.

Three

*

IDENTIFYING THE ABILITIES NEEDED FOR SUCCESSFUL LEARNING IN THE SOCIAL SCIENCES

An abilities based curriculum begins with instructional goals that encompass the acquisition of content knowledge and the acquisition of the intellectual abilities required for successful performance in a particular discipline. Therefore, the research task of the first year of the project was to identify the abilities associated with successful learning in the Social Sciences. More specifically, the challenge we faced was to create a procedure that would: (1) identify the abilities inherent in each course, separately, (2) determine which abilities were common across courses, and (3) plan where, when and how each ability could be taught, reinforced and assessed. The results of this part of the research are described in the following three chapters and are based on qualitative, process-oriented techniques. This chapter reports our findings in relation to the abilities necessary for successful learning in the Social Sciences, and describes the process through which they were identified and documented. Chapter Four describes how we integrated the abilities across the four *OMEGA* courses, while Chapter Five describes the process used to create assessment tasks that would simultaneously teach the abilities and evaluate student learning.

Identifying the Abilities

While most teachers are comfortable identifying and discussing the content knowledge students are expected to master, identifying the intellectual abilities inherent in a discipline requires a new way of thinking about teaching and learning. Although this kind of thinking must be done in order to create and operationalize an abilities based curriculum, there were no models in the literature for the research team to follow. Therefore, the first year of the research project had to be spent experimenting with different formats and procedures in an attempt to create a process through which the competencies or intellectual abilities required for successful learning in each discipline could be identified.

The first step in the process was for the teachers to begin thinking about the content knowledge and intellectual abilities inherent in their disciplines. Two questions were addressed. The first question, "what do you want students to learn?" was specifically asked to help teachers define the content knowledge required in their courses. Content or subject matter knowledge is found in the concepts, principles and theories of a discipline; it represents what a student of a particular discipline is supposed to "know." A second question, "what do you expect a competent student to be able to do at the end of your course?" was asked to begin the process of defining the intellectual abilities. Intellectual abilities represent what a student of a particular discipline is supposed to be able to "do" with what they "know." Intellectual abilities evolve as the student becomes more and more aware of what learning and understanding in the discipline actually consists of.

Defining content knowledge seemed to be an easy step. Defining intellectual abilities, however, was more difficult because it involved the labeling of invisible mental processes that can only be inferred from the specific subject content through which they are expressed. For example, in first year political science, a fundamental goal was for students to 'think like political scientists.' This involves creating a theoretical knowledge base that consists of an understanding of the basic facts, concepts and principles of the discipline. This part of the curriculum is usually found in textbooks and readings. To 'think like a political scientist,' however, also involves creating a sensitivity to the ways people in other cultures understand themselves and a healthy caution about applying currently understood definitions of concepts such as 'participatory and non-participatory cultures' to different political regimes. In order to develop these higher order thinking skills in analysis and political argument, students must be able to pose meaningful questions about different forms of political regimes and answer them logically the way a political scientist does. Students have to recognize that political science involves debate about how and why different regimes function, and forgo the idea that there is one right answer. Thinking like a political scientist, then, requires that students combine a strong theoretical knowledge base with complex thought processes that represent how a political scientist thinks and works. These complex thought processes are not written in a political science textbook. Becoming aware of what these abilities are required indepth, reflective thinking on the part of the instructor. Therefore, focusing on the competencies of a political scientist began the process of identifying the thought processes or intellectual abilities required for successful learning in the discipline.

We agreed that each teacher would prepare a journal that represented an indepth analysis of their discipline, as well as a documentation of the thinking, planning and decision making that went into our individual and joint curriculum designs. We were to focus our teaching plans on the two research questions discussed above. As the journal keeping progressed, it became clear that each class in every course had to be analyzed in order for us to collaborate in a meaningful way. This analysis required two stages: a planning stage and a debriefing stage. We met on a weekly basis to discuss curriculum plans. We agreed to plan two or three weeks in advance so that we could coordinate our teaching efforts. It was recognized and expected, however, that teachers' plans would not always be carried out because of the naturalistic nature of this research project. Therefore, at times, teaching adjustments had to be made. At the debriefing stage, teachers submitted a record of what actually took place in the classroom. This process continued for three years and had to be reinitiated every time a course was added to, or dropped from, the curriculum. The journals that were created in the first year of the project, were used to organize and integrate the curriculum in the second year of the project. By the third year, the abilities based curriculum had been formulated to such an extent that it could be operationalized with only minor adjustments.

The final format of the journal included six areas of curriculum design, or ways of thinking about the curriculum. Each area was deemed essential if an abilities based curriculum was to be activated in each course separately and in the project collectively. These categories included: initial input, content knowledge, intellectual abilities, learning strategies, classroom processes and assessment tasks or activities.

Initial Input, specifies where the material to be learned was located. The initial input of content knowledge might come from a textbook, a lecture, supplementary readings, a film or any combination of the above. ***Content Knowledge*** includes the subject matter of each discipline that is to be understood and mastered by the student. The subject matter of academic disciplines is made up of topics, concepts, principles and theories which offer a unique framework for discovering and explaining phenomena and ideas. Therefore, each discipline provides the student, or expert, with a unique way of conceptualizing the world around them. In the academic world, a conception describes how an individual makes sense of something such as classical conditioning, political regimes, the structure of a literary essay or the use of a topographical map. When a student has mastered the content knowledge of a course, we are saying that he or she is capable of relating to a concept or topic in the way that an expert in that subject does.

The term ***Intellectual Ability*** (or competency) refers to the cognitive processes or thought processes involved in learning and utilizing the content knowledge of a discipline. In order to learn content knowledge, the learner selects the information to be learned and transforms it from the working memory into the long-term memory for permanent storage. In order to utilize content knowledge, the learner has to apply the higher-level thinking processes used by experts in the discipline to solve complex problems. Therefore, as we analyzed our disciplines, we attempted to focus on the cognitive processes associated with memory (information processing), and the thought processes associated with higher-level thinking (or expert performance) in each discipline. Various models of cognitive and affective development were referred to as we met to discuss our common intentions in teaching (Biggs & Collis, 1982; Bloom, 1956; Donald, 1985; Miller, Williams, & Haladyna, 1978). Our task was to translate, adjust, and/or expand these models into clearly stated abilities that are meaningful to learning in the Social Sciences.

A student can use certain techniques during learning to activate their own cognitive processes. These techniques, referred to as ***Learning Strategies***, can be defined as behaviors or thoughts that facilitate encoding (placing information into memory) in such a way that knowledge integration and retrieval are enhanced. These thoughts and behaviors constitute organized plans of action designed to enhance learning outcomes and performance. The goal of any particular learning strategy may be to affect the learner's motivational or affective state, or the way in which the learner selects, acquires, organizes, or integrates new knowledge.

The ***Classroom Process*** describes how the students are organized and what they are asked to do during any class period. They might be asked to listen to a lecture and take notes, work collaboratively in groups, participate in a full class discussion, or complete an assessment task. ***Assessment tasks*** or ***activities*** were graded or non-graded assignments used to engage the students with the content of each course. They might be done in or outside of class. All assessment tasks were intentionally designed to activate and develop the intellectual abilities identified by the teachers as central to learning in the Social Sciences. This important aspect of the curriculum design was based on the belief that the cognitive processes or intellectual abilities underlying each task would ultimately become the intellectual abilities acquired by the students. The main objective of the research project was to match classroom processes and assessment tasks with the cognitive and affective goals of instruction.

The following journal entries, taken from the fifth and tenth week of the term, illustrate how the teaching journals were used to identify the abilities and then to schedule when and how each ability would be taught and reinforced across the curriculum. In the fifth week of the term, the English and Political Science teachers give a joint lecture to introduce the concept of a theoretical framework. The English teacher uses the concept of story (literary analysis), a theoretical framework familiar to the students, to prepare the way for the introduction of the concept of structural functionalism, a theoretical framework that is new to the students and potentially overwhelming. By connecting the already known concept of story to the unfamiliar concept of structural functionalism, students are able to activate their prior

Sample Journal

	POLITICAL SCIENCE Week 5	LITERARY CONCEPTS Week 5	INTRO. TO PSYCHOLOGY Week 10
Initial Input Lecture Readings Films Video	Joint presentation with English teacher using theory across the curriculum Readings: Intro. to the theory of comparative politics (21 pp)	Joint lecture with Political Science teacher	Film on Erikson's 8 stages Articles on Erikson's stages (10 pp)
Content Knowledge Topics Concepts Principles Theories	Theoretical framework: - a guide for interpretation - a guide for research - a guide for organizing an outline - a guide for writing a paper Structural functionalism and conflict theories Knowledge of the relationships between African countries Political map of Africa Doing periodical research	Introduction of Concept of Theory Structural functionalism as applied to literature and political science	Topics: Erikson's psychosocial theory, epigenetic principle and 8 stages of man Link made to Structural functionalism
Intellectual Abilities	Activating prior knowledge Seeing the relationship between ideas Understanding the hierarchical relationship between ideas	Understanding concept of theory Understanding concept of analysis Seeing the relationship between disciplines Making connections Elaboration Integrating the terminology into one's own syntax	Knowledge and comprehension of stages and applying concepts to generate questions for interview Recall knowledge of using a theoretical framework: (Structural functionalism and literary analysis) Knowledge Comprehension Application Analysis Synthesis
Learning Strategies	Identifying symbols on maps Situating countries geographically Concept mapping Using the library	Listening Note taking Linking recalled with new knowledge	
Classroom Processes	Group work on political maps Group work on concept mapping Note taking Training for orals continues	Note taking Teacher questioning of students' comprehension of lecture	Group work Students view film and generate questions based on 8 stages
Assessment Task or Activity Criteria (noted elsewhere)	Continue concept mapping of hierarchical and horizontal relationships In class exercise mapping the political system by structures and functions Library exercise on how to do periodical research	Quiz on definitions of concepts, the use of theory across two disciplines. Defined terms and answer the question "why use theory?"	Group work: each group presents essence of 1 stage and generates 4 questions to reflect that stage Individual work: each student selects questions and conducts interview of an older person and attempts to apply Erikson's theoretical framework to person's life story Research paper—case study

knowledge and link it to new learning. Seeing the relationship between the structure and function of a story made the task of analyzing the structure and functions of a political system less daunting. Five weeks later, the concept of a theoretical framework is revisited in the Psychology class with the introduction and application of Eriksen's theory of psychological development to a case study.

Once the journals were completed, each category was combined within and across all four courses. From the resulting lists, the research could get a clear indication of where, and how often, a particular intellectual ability or learning strategy was needed. The next step was to remove all redundancies and examine the lists to see if they could be sorted into a meaningful framework.

Results

The following results are based on an analysis of the teacher journals for the four main courses in the *OMEGA Project*: Introduction to Literary Concepts, Introduction to Political Science, Introduction to Psychology and Physical Education. These results focus on ***Intellectual Abilities*** and ***Learning Strategies*** because it was expected that the findings in these two categories would uncover the intellectual abilities required for successful learning in the Social Sciences.

Five areas of ***intellectual abilities*** emerged as being essential for successful learning in the Social Sciences: (1) developing an awareness about the Social Sciences, (2) the use of effective memory or encoding processes, (3) knowledge of the thinking processes used by experts in the field, (4) awareness of one's own learning process, and (5) the ability to work effectively in groups. These cognitive processes become activated when a student utilizes appropriate ***learning strategies*** that result in successful learning. For example, the first phase of "knowing," establishing a theoretical knowledge base, involves the cognitive operations involved in getting information into the long-term memory (encoding). The learner selects the information to be learned and activates rehearsal, elaboration, organizational, or metacognitive processes to place the information into the long-term memory. Learning strategies that might be used during this stage include copying or underlining, paraphrasing or summarizing, outlining a passage or creating a hierarchy. A metacognitive strategy might be using self-questioning to check understanding of the material presented in class (Weinstein & Mayer, 1986). Another important part of this encoding process is to build connections between new ideas and what is already known.

The second phase of "knowing," using the content knowledge to solve complex problems in the discipline, requires the ability to think about the concepts and principles at an abstract level. These two stages of learning are intricately linked, for memory is determined by what students do with to-be-learned information at the time of encoding. To the extent that students are required to deal with the meaning of content, their memory improves. Craik and Lochart (1972) call this levels of processing, Marton and Saljo (1976a; 1976b) refer to this as the difference between deep and surface learning. Research has shown that materials and activities requiring processing at the synthesis and analysis levels of the Bloom et al. taxonomy (1956) are recalled far better than materials processed at the knowledge or comprehension levels.

Therefore, learning or assessment tasks that focus students on the meaning of content lead to better memory. However, our experience indicates that meaningful assessment tasks cannot be designed until the intellectual abilities required for successful learning in the Social Sciences are identified. A condensed list of the ***Intellectual Abilities*** identified by the project teacher appears on page 49 and 50.

Intellectual Abilities

Thinking Like a Social Scientist Requires Knowledge, Understanding and Application of:

The language and logic of the discipline

- The idea of concepts and their referents
- Social Science concepts, terms and principles
  - The concept of theory
  - The concept of analysis
  - The concept of a theoretical framework
- The rules of classification such as mutual exclusivity and exhaustiveness
- The distinction between the normative and the empirical
- Inductive and deductive reasoning
- Social Science methods
- Social Science research techniques

The link between theory and practice

- Applying theory to explain phenomena
- Applying theory as a guide for doing research
- Applying knowledge to practical problems or situations

The relationship between and among ideas

- Organizing observations
- Understanding chronological sequence
- Distinguishing between the general and the specific
- Distinguishing between a hierarchical and/or lateral structure of ideas
- Using a theoretical framework as an organizing device
- Analyzing according to a theoretical framework
- Moving between the abstract and the concrete
- Formulating a hypothesis
- Formulating a theory
- Drawing conclusions
- Supporting conclusions with evidence
- Formulating convictions
- Arguing convictions based on values

The conventions of academic writing

- Integrating the language of the discipline into one's own syntax
- Selecting information from secondary sources
- Crediting others for ideas used
- Applying prewriting, drafting and editing strategies to a research paper
- Applying rules of grammar, spelling and sentence structure
- Applying procedures of documentation

Intellectual Abilities

Successful Learning in the Social Sciences Requires:

Developing awareness about building a positive attitude towards the Social Sciences

- Understanding how the Social Sciences can situate the individual into a larger context
- Understanding Social Science program objectives
- Understanding the relationship between the disciplines
- Understanding course objectives
- Relating course objectives to the program objectives
- Transferring content and abilities across the curriculum

Using cognitive processes associated with memory

- Paying attention to details
- Making observation
- Activating prior knowledge
- Making links between new learning and recalled learning

Knowing oneself as a learner (metacognition)

- Setting goals
- Linking course objectives to course content and task schedule
- Linking assigned readings and group tasks with writing tasks
- Diagnosing the demands of a learning task
- Seeking help when needed
- Applying evaluation criteria to own work
- Using feedback to revise own work

Using learning strategies

- Previewing Social Science readings
- Selecting important ideas from readings and lectures
- Selecting supporting ideas from readings and lectures
- Paraphrasing important ideas
- Mapping conceptual relationships
- Outlining, note taking, summarizing
- Using time management principles
- Planning a long term project
- Applying library research techniques
- Reviewing and preparing for classes
- Using study aids in texts

Interacting effectively in groups

- Applying group dynamic theory to carry out a task effectively
- Valuing the ideas of others
- Criticizing constructively
- Being able to simultaneously accomplish a task and observe group processes

Discussion

If a student is going to relate to a concept in the same way that an expert in the area does, the student has to be able to establish a theoretical knowledge base and use that knowledge base to solve complex problems in the discipline. Research on the differences between experts and novices (Chase & Simon, 1973; Chi, Glaser, & Rees, 1982; Larkin, McDermott, Simon, & Simon, 1980) demonstrates that compared to novices, experts in a particular content area bring a knowledge structure to the learning task that is more organized, complete and coherent. These findings have been consistent in different domains, for example, chess play (Chi, 1978, 1981), physics (Chi, Glaser, & Rees, 1982) and electronics (Egan & Schwartz, 1979). In all of these areas, the difference in the knowledge structures and cognitive processes of the novice and the expert is evident in the way that the knowledge (problem) is represented. Novices' representations are organized around the literal facts and events given in a problem statement. They may be able to use problem solving heuristics, but their thinking is limited by an inability to infer further knowledge from the literal cues in the problem statement. In contrast, the knowledge of experts is organized around inferences about principles and abstractions that subsume these facts.

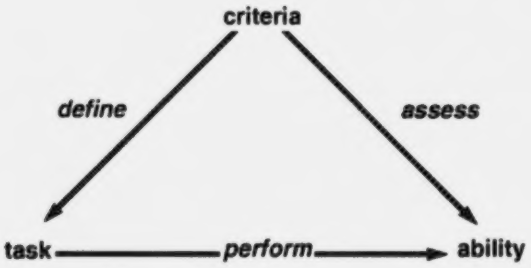
It follows then, that although the acquisition of content knowledge is crucial, it may not be sufficient for higher-level learning in a discipline. A curriculum which focuses on the abilities that characterize expert performance in the discipline as well as on the content is necessary. The first challenge facing college teachers attempting to create an abilities based curriculum, therefore, is to label the cognitive processes or intellectual abilities exhibited by experts in their disciplines.

Any discipline can use the model of teacher journals presented in this chapter as a framework for carrying out this process. These journals served as a primary data source for the identification and validation of the abilities, as well as an essential curriculum planning tool. The labeling of these abilities can be a long process. The benefit, however, of engaging in such a process is that the hidden curriculum, finally, becomes visible.

Four

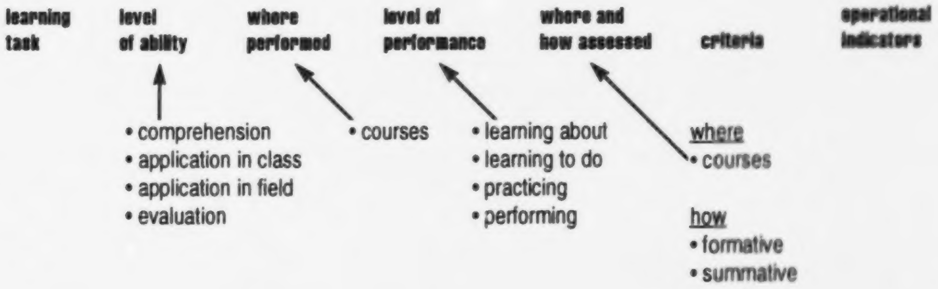
INTEGRATING THE ABILITIES BASED CURRICULUM

Once the intellectual abilities needed for successful learning in the Social Sciences were identified, the process of instruction focused on linking these goals with learning tasks especially designed to teach and measure them. In an abilities based curriculum, each task is linked to a specific hierarchical level of the ability to be mastered. The task is two-sided in that it is both a teaching and an assessment task. Tasks are performed by students and assessed by teachers. Performance is assessed by applying explicit criteria which are linked to the level of ability being learned. These criteria are operationalized as indicators so that they can be immediately recognized and manipulated by both the performer and the assessor. In essence, the criteria are used to both define the task and assess how well the learner has mastered the ability. The diagram below illustrates the essential relations among abilities, task and criteria:



Learning tasks are usually anchored in specific courses. In our project, however, the tasks were often jointly assigned. For example, oral presentations and research papers and frequently the teaching, reinforcing and assessing of performance for a given level of ability were spread out across several courses. Students were also asked to perform similar tasks in various courses. Integrating the courses through the learning tasks gave continuity to our project and to our curriculum. It allowed us to plan where, when and how each ability would be taught, reinforced and assessed. It also encouraged students to transfer the abilities learned in one course into another.

This process of integration occurred both laterally and chronologically. In order to show this integration the following diagrammatic grid was constructed and is used in this section of our report to demonstrate how the desired learning outcomes in various courses were integrated around the learning tasks. The categories of the grid reflect the linkages found in an abilities based approach to education. Each category is explained in more detail below.



learning task
level of ability
where performed
level of performance
where and how assessed
criteria
operational indicators
• comprehension
• application in class
• application in field
• evaluation
• courses
• learning about
• learning to do
• practicing
• performing
where
• courses
how
• formative
• summative

The ***learning task*** is the empirical, action-oriented component of learning. The task is most often content-related. It is the place where the curriculum, the teacher and the student interface. This is also the place where the traditional disciplinary content dovetails with the learning and performing of the ability. The latter allows mastery of the former. Examples of broad tasks are analyzing a system, building a research design, carrying out a research design, researching an essay, writing an essay, organizing and delivering an oral presentation, or going on a hiking and camping weekend. More specific examples of tasks are paraphrasing the main components of a story or of a political system, reporting to the class on the main aspects of a content-based discussion, doing a literature review, climbing a mountain, collecting data, or using a map and compass.

The concept of an ***ability*** has already been defined in this report. Abilities are divided into levels which are hierarchically organized from lower to higher. These levels are generally considered to move from knowledge, through comprehension, application, analysis, synthesis and finally to evaluation. Furthermore in analysis, for example, three sub levels can be accounted for: identifying elements, identifying relationships among these elements and identifying the organizational principle which defines these relationships. In the OMEGA curriculum, tasks were intentionally designed to develop specific levels of the ability.

The next two categories are labeled ***where and how performed*** and ***level of performance***. The former refers to the course in which the task is performed and the latter refers to the level at which it is performed in that course—from learning about, to learning to do, to practicing, to reinforcing practice, to actual performance in the field.

Where and how assessed refers to the place and the manner in which the student performance was assessed. Performance can be assessed in a single course, in several courses simultaneously or in succession, from one semester to the next. Assessment can be formative, that is an ongoing process where feedback becomes new learning, or summative in the form of a final evaluation in order to assess the level of ability attained. This category also refers to who assesses. Theoretically several modes are possible: self-assessment, peer assessment, teacher assessment, external assessment. In our project most assessments were carried out by teachers.

The last two categories, ***criteria*** and ***indicators***, are closely linked. The criteria are the standards which govern both performance and assessment. It is according to these that the task should be defined, performed and assessed in order to attain the desired level of ability. The indicators are the operationalized criteria, which are much more concrete and measurable than the abstract criterion to which they usually refer. They are task oriented. They are also transparent, well publicized and distributed to students before doing the task.

The integrated approach to teaching and learning the curriculum has both a horizontal and a vertical dimension. The vertical dimension is chronological, suggesting a process of building up different levels of the ability and the idea that prerequisites are essential. The horizontal dimension is the integration process where task, level of ability, performance, assessment and criteria are matched.

Application of the Analytical Grid

This section describes the application of this analytical grid to the teaching and learning of the abilities of group interaction, communications and analysis as they were operationalized in the third year of the project. Only major tasks are treated in our analysis. The grid for each chart is included, along with a description of its operation. The reader will note that there is considerable overlap between the communications and analytical abilities.

Group Interaction

As the first chart demonstrates, the ability of group interaction is broken down into several levels: knowledge of the theory of group interaction, translation of that knowledge in various contexts, comprehension of the knowledge, using the theory of group interaction to interpret classroom situations, application of the knowledge in various organizational tasks, synthesis of the knowledge and experiences gained into discipline specific tasks where a synthesis or group decision is required and, finally, evaluation of self and peers from the perspective of the theory of group interaction. The tasks range from identifying, defining and paraphrasing elements of the theory to various levels of applying the ability in class, in controlled situations and in the field, namely, doing IM research and climbing a mountain. Tasks are matched to levels of ability. Tasks are also where the course content is linked to the learning or performing of the ability. Each course is plugged into the grid as the place where the performance of the level of the ability is learned, reinforced, applied or assessed. Each course is also specified as the place where either formative or summative assessment is carried out. Finally, a set of more or less specific criteria is matched to the task and, where needed or available, indicators are specified for these criteria.

Communications

Developing the communications ability began in the English course. Here students furthered their ability to write summaries and paraphrases, learned how to organize an expository essay and were introduced to basic documentation techniques in the Social

Group Interaction

learning task	level of ability	where performed	level of performance	where and how assessed	sample criteria	sample operational indicators
identify, define, paraphrase elements	knowledge and translations	English 1st and 2nd semesters	learning	English – formative and summative	uses own syntax to link all elements	complete sets of g.i. behaviours
apply the theory to a group discussion	comprehension and interpretation	English 1st and 2nd semesters	learning how to apply; practicing	English – formative and summative	correctly applies elements of theory	matches element with its correct manifestation
oral group presentation of the components of a piece of literature	application level 1: organizing a group task	English 1st and 2nd semesters	learning how to perform	English – formative and summative	efficient and complete communication	integrated division of labour; correct report
oral group presentation of main ideas in a psychology unit	application level 1: organizing a group task	Psychology	reinforcing learning how to perform	Psychology – formative	efficient and complete communication	integrated division of labour in group
group discusses concepts of comparative politics and reports	application level 1: organizing a group task	Political Science	reinforcing learning how to perform	Political Science – formative	efficient discussion and complete report	integrated division of labour; correct report
gathering data as a research team	application level 2: synthesis	I.M. Research Methods 2nd Semester	performing in the field	I.M. formative and summative	efficiency over long term	sustained, integrated division of labour
climbing a mountain as a team	application level 2: synthesis	Physical Education 1st semester	performing in the field	Phys. Ed. summative	efficient planning and implementing	problem-solving; crisis management
write individual log	evaluation	Phys. Ed. & English 1st semester	performing in the field	Phys. Ed. and English – summative	evaluating in terms of theory	using correct concepts properly

Sciences. Several associated learning strategies such as previewing a text, selecting main ideas and doing library research were also taught simultaneously in the English, Political Science and Psychology courses and in the seminars on learning strategies.

After the students had learned the basics of writing and research they were assigned more important tasks in their three courses. These tasks required a mastery and a synthesis of the earlier ones. Students were asked to apply their ability to paraphrase, organize, document and present a written work. This higher level of ability required that they set context, develop theses and methodologies, apply methodologies and draw related conclusions. The three tasks, the expository essays in English and in Psychology and the comparative essay in Political Science, reinforced the teaching and learning of the communications ability begun in the English course. The same criteria were used by the three teachers. Formative assessment was used throughout, from one semester to the next. At the end of the first semester a joint Political Science/English task was assigned which required the student to perform at a higher level of the written communications ability, as well as at a higher level of the analytical thinking ability. (This task is referred to again in the following section, Analysis.)

One advantage of a year long curriculum and of intact groups is that the process of assessment as learning can continue from the Fall to the Winter semesters. In the second semester the development of the student's writing ability continued. Three essays aiming to develop both communications and analytical abilities were assigned in the English course. Also in the second semester, in the Introduction to Methodology course, a major research report was required. In the first semester students were introduced to the criteria governing the writing of a research report in a Psychology assignment. In the second semester, they are required to further that ability by actually carrying out research in the field, most frequently as an experimental or survey design. The criteria for the performing and assessment of this task represent a combination of the straightforward protocol for scientific research and the criteria of the expository essay learned in the first semester.

Communications

learning task	level of ability	where performed	level of performance	where and how assessed	criteria	operational indicators
writing summaries and paraphrases	application in controlled situations	English	learning how	English – formative and summative	selects main ideas	expresses main ideas in own words
organizing an expository essay	comprehension and application	English	learning how	English – formative and summative	format, transitions context, thesis, method, conclusion	thesis, main ideas, examples, draws conclusions
using documentation sources in an essay	comprehension and application	English, Poli. Sci., Psychology	learning how and reinforcing	English, Poli. Sci., Psychology, formative and summative	correct documentation techniques	quotes, paraphrases, parenthetical style, works cited, biblio.
organizing, presenting documenting, evaluating an essay	application	English	learning how to perform	English – formative and summative	presentation – documentation – writing style – thesis – development – method – evaluation	title, type, indents, sources, vocabulary, sentence structure, punctuation, transitions, etc.
writing an expository essay on a psychological issue	application	Psychology	reinforcing and performing	Psychology – formative and summative	same as above	same as above
writing a comparative essay	application	Poli. Sci.	reinforcing and performing	Poli. Science formative and summative	same as above	same as above
writing a research report on application of a psychological theory	application	Psychology	learning how to perform	Psychology – formative and summative	same as above	same as above
researching and writing an essay evaluating a political system	application	Poli. Sci. and English joint task	performing	Poli. Sci. and English – formative and summative	presentation organization documentation thesis methodology evaluation writing style	same as above
writing three essays	application	English 2nd semester	performing	English – formative and summative	same as above	same as above
writing a research report	application in the field	Introduction to Methodology	performing	I.M. – formative and summative	as above plus criteria for research report protocol in the Social Sciences	research question, hypothesis, design, data collection, data organization, data analysis, evaluation, conclusion

Analysis

Development of the analytical thinking ability began at the stage of defining the tools of analysis; that is concepts, conceptual constructs and complete theoretical frameworks. Students were introduced to this new vocabulary simultaneously in their English, Political Science and Psychology courses. The criteria for performance and assessment was whether or not the student could use this new terminology in their own writing. In Political Science, students spent time developing concept maps; that is, working with diagrams of concepts, juxtaposing these in various configurations and labeling the connections. The performance criteria for this task was whether or not the student established proper vertical linkages that respect the hierarchy of the phenomena under study and the more tentative exploration of possible horizontal or lateral linkages which would eventually be used to develop hypotheses and themes.

To emphasize the point that analytical thinking occurs in all disciplines, a lecture in theory was given jointly by the Political Science and English teachers. The teachers stressed that the same conceptual and theoretical vocabularies and notions are applied both in formal literary analysis and in structural functional analysis. The lecture was followed by a test which required students to demonstrate their understanding of these notions by defining terms and using the vocabulary.

The application level of the ability of critical thinking began simultaneously in several tasks spread across the *OMEGA* curriculum. For example, students were required to analyze a piece of writing in English using the formal approach; to apply a main theory of psychological development in Psychology; to use an analytical framework developed in earlier concept-mapping tasks in order to compare two political systems; and to use compass and map theory to navigate in the field. The principal ability in all these related tasks was the use of theoretical frameworks to analyze phenomena in various fields, and to demonstrate this ability in joint writing assignments. One of the most comprehensive of these assignments was the joint Political Science/English paper, the development of which is described at length in the following chapter.

Analysis

learning task	level of ability	where performed	level of performance	where and how assessed	criteria	operational indicators
define concept and conceptual construct	knowledge and comprehension of theory	Poli. Sci., English, Psychology	learning about theory	Poli. Sci.,– English, Psychology, formative	paraphrases conceptual relationships	proper terminology in proper place
concept mapping	comprehension of elements of theory	Political Science	learning how to abstract	Poli. Sci.– formative and summative	makes proper vertical and horizontal linkages	respects hierarchy; labels all linkages
attend joint lecture on the use of theory	comprehension across the curriculum	Political Science and English	learning about theory across the curriculum	English and Poli. Sci., formative and summative	understands structural functional terminology	system structure function framework theory
compare 2 political systems in a controlled situation	application: identifies elements and relationships	Political Science	learning to perform	Political Science formative and summative	develops theme and methodology; follows method	specific structures and processes; similarities and differences
apply the theory of psychological development in the field	application: level 1: matches theory and	Psychology	learning to perform	Psychology – formative and summative	develops and applies hypothesis/ methodology and evaluates	constructs elements of research design (sample, questionnaire)
use compass and map to navigate	application level 2: synthesis	Physical Education	learning to perform and performing	Phys. Ed. formative and summative	applies method to reach destination	time
apply formalist approach of literary criticism	application and evaluation	English: 2nd semester	learning to perform	English formative and summative	makes proper use of theory	components, relationships, patterns
apply sociological approach of literary criticism	application and evaluation	English 2nd semester	learning to perform	English formative and summative	makes proper use of theory	components, relationships, patterns
apply feminist approach of literary criticism	application and evaluation	English 2nd semester	learning to perform	English formative and summative	makes proper use of theory	components, relationships, patterns
design and carry out a research project	application and evaluation	Introduction to Methodology 2nd semester	learning to perform	Intro to Methodology formative and summative	makes proper use of theory	social scientific protocol; hypothesis, design

Five

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DEVELOPING LEARNING/ASSESSMENT TASKS AND ESTABLISHING PERFORMANCE CRITERIA

An important challenge that we faced as we went through the process of developing an integrated curriculum was to create learning and assessment tasks which would foster deep understanding in our students of the subject matter and, at the same time, allow us to assess whether or not the student had mastered the complex abilities associated with successful learning in the Social Sciences. In this section, we describe in detail the development of one of the most complex of these assessment tasks and the process we followed to establish the performance criteria which we used to assess students' analytical thinking and communication abilities.

Developing the Assessment Task: Fall 1991

For Social Science students important cognitive outcomes had been identified as "understanding the concept of theory" and "applying a theoretical framework." The teaching of theory, we determined, could be linked to the development of language abilities by structuring two courses, English and Political Science around one major assessment task: the research paper which would teach and assess understanding and application of theory, as well as the ability to write a college level paper involving summarizing, paraphrasing and correct documentation procedures.

Instructional objectives of the Political Science course specify that the successful student should be able to describe the elements of the comparative method in the discipline, describe the four interactive processes characterizing political regimes, organize these elements into a framework for the analysis of regimes, and apply this framework to the study of two contemporary political regimes. Throughout the term students were initiated into the comparative method through lectures and readings. The four interactive processes were introduced through the construction of structural maps of the ideal type regime. They were then asked to put together a comparative framework using specific structures and functions from each of the interactive processes, instructed in library research techniques and sent to the library to do the necessary research.

At the same time the English teacher taught students how to organize the paper as well as how to summarize, paraphrase and document. Since the paper required students to apply the comparative framework to the study of two contemporary political regimes, considerable time was spent teaching students how to organize a paper which used comparison as a method of development.

Two separate sets of evaluation criteria were developed and distributed to the students. Criteria for evaluating presentation, organization, documentation and writing style were explained by the English teacher while the Political Science teacher presented criteria focussing on the ability to understand and to apply the theoretical framework of comparative politics.

Analysis of Student Papers: Fall 1991

Although the papers were mechanically correct and demonstrated some degree of organization, our evaluation revealed that the objectives of the Political Science course had been only partially attained. Students did not master the ability to compare two political regimes according to the methodology developed in their term paper outlines and the theme developed in their introductions. There was a definite lack of integration between the theory and the methodology on one level, and between the theoretical framework and the research findings on another level. Students were also unable to tailor their conclusions to the theory and to the research findings.

One problem seemed to arise from a too sharply defined separation between what was taught in the English classroom and what was taught in Political Science. By separating form from content, we had formulated a set of rules which our students had difficulty transferring to the written application of a theoretical framework which they were learning in another classroom.

A more fundamental problem arose from our attempt to provide students with an appropriate organizational pattern which they would then apply in the production of their papers. Unfortunately, although the goal was to develop our students' ability to engage in conceptual thinking, in order to teach the students how to organize a comparative paper, we tended to emphasize the concrete rather than the abstract. Therefore the students tended to produce papers which compared two countries based on very concrete and factual information rather than evaluating two political regimes within a theoretical framework. It seemed that by emphasizing an organizational model based on "comparing" and "contrasting" we had operationalized a learning outcome which was much lower than the "ability to apply the framework of comparative politics."

As a result of our analysis, we concluded that the ability to apply theoretical concepts to an analysis of concrete situations ought to be divided into levels with level one being the identification and description of theoretical concepts; level two requiring a simple analysis of a controlled comparative situation in class using selected concepts; and level three corresponding to the selective use of the comparative theory to analyze a real life situation.

We also concluded that it was the process of analysis itself which should provide the organizational pattern for the paper and it was to the theoretical framework that the student should refer to make transitions and to create connections between components. This would ensure that it would be the abstract and logical bonds provided by the analytical framework which would give the paper its cohesion and coherence, rather than the concrete bonds provided by the organization of facts and information into a pattern of similarities and differences.

Analysis of Student Papers: Winter 1992

During the second semester, while continuing to develop students' communication abilities, the English course focussed more explicitly on analytical thinking. The two ability levels, "understanding the concept of theory" and "applying a theoretical framework" were extended and reinforced by introducing students to two theories of literary criticism: formalist and sociological criticism. During the term, students were required to write a number of literary analyses in which they applied these two theories to the analysis of short stories and novels.

We examined these papers carefully, comparing them to the political science papers, and discovered many of the same weaknesses: a tendency to summarize and describe rather than to seek relationships between and among elements and thus uncover the pattern that gave the literary work its unity and meaning. However, we also noted one important difference. Because the students had been introduced in high school to the basic vocabulary which is used to describe the structure of stories, they were able to reach the first ability level, "understanding the theories," much more quickly and easily, although application was still weak.

As we examined the literature papers we also noted the similarities in the theoretical frameworks we were teaching. Both structural functionalism and formal literary analysis focus on the notion of the whole and the interrelationship of the parts which make up that whole. The formalist analyst sees the unity of the literary work as being the result of the harmonious interaction of all the elements as they work together to form a unifying pattern. Analysis involves the uncovering of that pattern through the examination of the role that each element plays in the formation of a unified whole.

Similarly, structural analysis as it relates to the Social Sciences also leads the analyst to posit the existence of parts of the whole, to query the role that each part plays for the whole and to examine relationships among these various parts. Parts are theorized to be structures and processes. These, in turn, are said to have functions to fulfill for the whole. Thus both formal literary analysis and structural functionalist analysis can be said to treat the object of analysis as a system; that is, a network of structured interrelationships where each part fulfills a function for the whole.

Students are familiar with this approach as it relates to story and know the basic terminology: character, plot, setting, imagery, symbolism. They also understand to an extent that each element plays a role in the story and these roles must be examined in order to arrive at the theme of the story. Therefore we believed that we could use their understanding of story structure as background knowledge to facilitate the introduction of the concept of systems theory. The focus on systems theory would allow for a more integrated approach to the development of higher cognitive processing in the two courses and also allow us to abandon the problematic comparison-contrast rhetorical model as an organizational device. At the same time it would give us a common focus for the development of assessment instruments which would operationalize conceptual thinking.

Developing Intermediate Tasks: Fall 1992

We now had an understanding of the ability and of the levels of cognitive processing involved in its development. Accordingly we revised our classroom methodology by introducing a number of formative tasks which we believed would lead to mastery.

Having assessed as one of the major problems in the term paper the students' tendency to describe and summarize rather than to analyze, we decided to deliver a joint lecture on the process of analysis and the nature of a theoretical framework. Drawing on students' background knowledge of story structure, we introduced the notion of system analysis and demonstrated how theory is used as an analytical and organizational framework. We then developed a task in the English course which would move students into the first stage of conceptual thinking: to look for relationships and to discover a pattern. At the same time they would learn to summarize, paraphrase and document sources, techniques which would later be applied in the political science term paper.

The area of investigation chosen was of current interest, inspired by the July 1992 L.A. riots: The Afro-American struggle for equality and civil rights. The material was controlled by the teacher. All students were given a set of readings and a chronological listing of relevant historical events beginning with the Civil War and ending with the current L. A. riots. The task was divided into levels:

1. to classify the events
2. to seek relationships between and among classifications

3. to discover a pattern
4. to draw conclusions which accounted for the pattern
5. to formulate a thesis
6. to write a documented analysis on the subject

The pattern that students were expected to discover was fairly obvious: the repetition of a cycle of events which involved civil unrest, enactment of civil rights legislation, the absence of implementation of legislation, followed by further civil unrest and re-enactment of legislation without implementation. Students were then given a simple organizational model based on this process of analysis.

INTRODUCTION
Introduce topic
Establish context to orient reader
State thesis
Explain method of analysis

BODY
Stage I: 18 -- 19 --
Describe events
Analyze events
Draw conclusions

Stage II: 19 -- 19 --
Describe events
Analyze and compare to previous section
Draw conclusions

Stage III: 19 -- July 1992
Describe events
Analyze and compare
Draw conclusions

CONCLUSION
Summarize conclusions already drawn
Relate to thesis
End with implications for future

As a formative task this assignment taught students to differentiate between description and summary and analysis. It further taught them that description and summary must be selective in order to provide evidence for conclusions. It moved them into conceptual thinking as it required them to look for relationships in order to abstract a pattern. And, finally, it prepared them for the application of a theoretical framework within which to explain phenomena.

The formative nature of the task was reinforced through the process of revision. Each paper was analyzed to determine whether the student was able to describe the method of analysis, perform the various steps of analysis, derive conclusions, project implications. Students who failed to perform at any one of these levels were given further instruction and required to revise their papers.

Assessment of the Fall 1991 term papers had revealed a major weakness in the students' ability to use an analytical framework. In order to address this weakness, we decided to assign an intermediate task in the Political Science class at about the mid term mark which would familiarize students with the application of an analytical framework and give them practice and feedback on their ability to actually carry out this exercise. The task would prepare them for the joint Political Science/English research paper which remained as their major task at the end of the semester.

The intermediate task was inspired by the NAFTA negotiations then in progress and much in evidence in the media. The focus of the task was a comparative analysis of the Mexican and Canadian political regimes. The teacher put together controlled material consisting of two descriptive eight page papers, one each on the Canadian and Mexican political systems. These descriptive papers were written specifically for the task at hand, that is, from a structural functional perspective using the categories of the analytical framework as organizational benchmarks as much as possible. These two political systems represented fairly well the ideal types of democratic and authoritarian regimes and lent themselves to the objective of doing analysis in order to evaluate democratic or authoritarian potential.

The intermediate writing task was to develop the theme of the relationship of the state to civil society by applying the analytical model developed in the earlier mapping task to the descriptive information on the Mexican and Canadian regimes provided in the controlled information papers. The form of this task was to be an essay of 750 words, correctly written and documented. Students were given a check list of components, resources and criteria. Specifically the task was divided as follows:

1. to develop the theme of the relationship of the state to the civil society
2. to present the analytical comparative framework used as methodology
3. to identify the pertinent evaluation criteria
4. to apply the analytical framework to each regime
5. to evaluate each regime as either democratic or authoritarian based on the results of the analysis.

In addition to teaching students to apply a simplified theoretical framework to the analysis of controlled information, thus differentiating between description and analysis, this intermediate task also influenced students to engage in conceptual thinking by requiring them to look for relationships and patterns in order to be able to evaluate. It taught them as well to carry out a task over a sustained period of time and to link various aspects of the political science course within one assignment.

Developing Performance Criteria

It was from these two intermediate tasks that the revised performance criteria for the political science research paper were derived. First we developed an organizational outline based on the process of analysis that the students had practiced in their English assignment. Then we translated the outline into specific criteria for the political science paper. These criteria were then distributed to students and explained by both teachers.

ACADEMIC ESSAYS—*OMEGA* COURSES
EVALUATION CRITERIA

ORGANIZATION

INTRODUCTION

Establishes context . . . . ☐
States or implies thesis . . . . ☐
States or implies method of development . . . . ☐
States or implies method of analysis . . . . ☐
Writing is smooth . . . . ☐
Writing is clear . . . . ☐
Appropriate number of paragraphs . . . . ☐

BODY

Uses paragraph units appropriately . . . . ☐
Each unit relates to thesis . . . . ☐
    develops thesis . . . . ☐
    follows method of development . . . . ☐
    follows method of analysis . . . . ☐
    provides evidence . . . . ☐
    analyzes evidence . . . . ☐
    draws conclusions . . . . ☐
    provides transitions . . . . ☐
Writing is smooth . . . . ☐
Writing is clear . . . . ☐

CONCLUSION

Summarizes conclusions already drawn . . . . ☐
Relates to thesis . . . . ☐
Ends appropriately . . . . ☐

COMMENTS

OMEGA RESEARCH PAPER: POLITICAL SCIENCE
EVALUATION CRITERIA

ORGANIZATION

INTRODUCTION

- Establishes context ☐
- States/implies thesis: relationship of state to civil society ☐
- States method of analysis: comparative theory paraphrased ☐
    - analytical framework described ☐
    - structures and processes identified ☐
    - evaluation criteria described ☐
- Writing is smooth ☐
- Writing is clear ☐
- Appropriate number of paragraphs ☐

BODY

- Uses paragraph units appropriately ☐
- Each unit relates to thesis ☐
    - develops thesis ☐
    - follows method of analysis ☐
    - provides evidence on selected structures and processes ☐
    - analyzes evidence by comparing to ideal type ☐
    - draws conclusions by evaluating regime according to criteria set forth in introduction ☐
- Refers to analytical framework to provide transitions. ☐
- Writing is smooth ☐
- Writing is clear ☐

CONCLUSION

- Summarizes conclusions already drawn ☐
- Relates to thesis ☐
- Ends appropriately ☐

COMMENTS

OMEGA RESEARCH PAPER: POLITICAL SCIENCE EVALUATION CRITERIA

RESEARCH TECHNIQUES

USE OF RESOURCE MATERIAL

Uses enough ☐
Uses appropriate type and variety ☐
Uses sources to provide support and evidence ☐
Avoids overuse ☐
Draws own conclusions ☐

INTEGRATION INTO ESSAY TEXT

Introduces quotations ☐
Uses quotations appropriately ☐
Uses paraphrasing appropriately ☐
Integrates quotations into own writing ☐
Credits all sources in text of essay ☐

DOCUMENTATION

Uses parenthetical style ☐
Documents paraphrases ☐
Documents quotations ☐
Provides Reference/Work Cited Page ☐
Correct Format ☐
Provides Bibliography (if necessary) ☐

COMMENTS

ELEMENTS OF STYLE

VISUAL PRESENTATION

Title Page ☐
Spacing – double spaced ☐
  LEFT margin ☐
  RH margin ☐
Indentation – paragraphs ☐
  quotations ☐
Pages numbered ☐
Typing – accurate ☐
  neat ☐

WRITING STYLE

Academic tone ☐
Appropriate vocabulary ☐
Avoids personal (I/you) approach ☐

MECHANICS

Sentence structure ☐
Punctuation ☐
Grammar ☐
Spelling ☐

COMMENTS

Developing the Criteria Referenced Assessment

Now that performance criteria had been established which operationalized higher level cognitive processing, it remained to develop an instrument of analysis which would allow us to articulate the specific criteria used to assess performance and to verify empirically the accuracy of our assessment.

Again we followed an inductive process by examining the papers. We chose the two best papers and each teacher analyzed one paper according to our respective disciplines. The English teacher performed a textual and structural analysis to discover whether the use of theory was the unifying pattern which gave the paper its coherence and meaning. Concurrently, the Political Science teacher isolated indicators of the ability to use theory as a heuristic and developed assessment categories by grouping these indicators.

Since we were attempting to assess attainment of cognitive objectives we turned to the literature of learning theory in our search for a theoretical framework within which to conduct our analysis. The most appropriate appeared to be Bloom's taxonomy wherein six categories of cognitive objectives are described and organized in hierarchical levels. We organized the indicators and categories of the ability to use theory as criteria pertaining to the levels of thinking defined and described by Bloom. We then translated Bloom's general instructional objectives into specific objectives applicable to the use of theory.

At this point we were able to refine the instrument of analysis, defining three levels of the ability and specifying the tasks corresponding to each level. The objectives relating to those levels became operationalized as the criteria of students' achievement. We then organized these criteria into categories of achievement under each level and applied the refined instrument to a selected group of papers. Our purpose was twofold: first, to test the validity and the reliability of the measuring instrument as an assessment tool; second, to verify the students' competency in the use of theory. Student papers were selected by the two teachers on the basis of the evaluation done at the end of the Fall 1992 term. We chose nine papers in three categories: good, medium and poor. A grid of the analytical instrument was prepared and applied to the papers in each category. The following is a description of the ideal, good, medium and poor papers.

The ideal paper should develop the theme, paraphrase the comparative theory, describe the analytical framework, select sets of structures and processes to be analyzed and select and operationalize relevant criteria. The content of the paper should then be organized according to this analytical framework, the regime evaluated according to the criteria retained and, finally, referring back to the theme and the purpose of the analysis, the paper should reach conclusions about the democratic or authoritarian nature of the regime under study, based on the findings presented. This ideal paper should maintain congruity throughout.

Not surprisingly, none of the student papers reaches this ideal. Upon reflection, we concluded that this ideal should approximate the level of competence at which the Social Science student enters university.

Examination of papers assessed as good reveals that these students succeed in achieving competence in the first two levels of the ability; that is, comprehension of the theory of comparative politics and the development of the analytical framework, with some difficulties becoming apparent in linking components of the system one to another. Good students do not lose sight of the purpose of their analysis and are thus able to provide coherence and continuity throughout.

Nevertheless, these good students demonstrate noticeable difficulty in using the analytical framework to organize the content of the paper. This is particularly evident when they attempt to make transitions from one component of the political regime to another. Nor do these students use the analytical framework to organize their research findings, relying more often than not on the organizational framework of their research sources. However, they apply the appropriate criteria to evaluate the specific structures and processes, their concluding statements tend to be related to the purpose as outlined in their introductions and their conclusions tend to be in tune with their findings.

Medium students, those who attain a moderate or adequate level of competence,

Analysis of an Ability

The Use of a Theoretical Framework in a Research Paper in Political Science

Level of Ability:	**I.** Comprehension of Theory: Comparative Politics	**II.** Development of an Analytical Framework	**III.** Application of the Analytical Framework
Task:	Develop theme Paraphrase comparative theory	Describe analytical framework Select structures and processes to be analyzed Extract appropriate criteria for evaluation	Use the analytical framework to organize paper Use the analytical framework to evaluate selected regime Conclude on nature of regime
Performance Criteria:	Makes purpose of analysis explicit In paraphrase uses proper terminology and integrates terminology into own syntax Refers to, defines and integrates systems theory, structural functionalism in a comparative approach	Deduces analytical framework from theory Describes the four components of the framework Links the four components functionally to one another Makes explicit the purpose of the analysis by relating selected structures and processes to purpose (theme) Extracts relevant evaluation criteria from theory Operationalizes these criteria	Refers to framework when making transitions from: a) establishing context to developing purpose (theme) b) developing theme to identifying methodology c) developing methodology to initiating presentation of evidence d) ending presentation of evidence to evaluation e) evaluation of regime to presenting conclusion Uses analytical framework to organize research findings Makes concluding statement related to purpose and to findings
Scale of Performance by Categories of Achievement:	Develops theme as purpose of analysis Restates theme but does not develop as purpose Does not develop theme Paraphrases using full terminology: regimes, system, functions, structures, comparison Paraphrases with respect to hierarchy of theoretical components Links paraphrase to analytical framework Paraphrases with omissions Does not attempt paraphrase Attempts paraphrase but actually copies from text	Describes analytical framework, makes functional links of components and links selected structures and processes to purpose of analysis as developed in the theme Attempts description but lacks explicit understanding of the functional relationships among components Attempts description but lacks comprehension of theory Does not describe analytical framework Selects, defines and relates appropriate structures and processes Selects but does not relate to the purpose (theme) Does not select structures and processes Operationalizes criteria Extracts and identifies criteria Criteria are relevant to selected structures and processes and to purpose of analysis Does not extract criteria from theory	Makes all transitions from a) to e) above Makes transitions for some Does not make any of the transitions Uses analytical framework to organize coherent presentation of research findings Attempts to organize research findings but lacks coherence because of use of inappropriate components Does not use components of analytical framework to organize research findings Applies appropriate criteria to evaluate specific research structures and processes Applies wrong criteria Does not apply evaluation criteria Makes conclusion in tune with findings and purpose Attempts conclusion but has lost sight of purpose Does not make concluding statement Reaches unwarranted conclusion

Assessment of an Ability

The Use of a Theoretical Framework in a Research Paper in Political Science

Level:	**I.** Comprehension of Theory: Comparative Politics	**II.** Development of an Analytical Framework	**III.** Application of the Analytical Framework
Task:	Develop theme Paraphrase comparative theory	Describe analytical framework Select structures and processes to be analyzed Extract appropriate criteria for evaluation	Use the analytical framework to organize paper Use the analytical framework to evaluate selected regime Conclude on nature of regime
Performance Criteria:	Makes purpose of analysis explicit In paraphrase uses proper terminology and integrates terminology into own syntax Refers to, defines and integrates systems theory, structural functionalism in a comparative approach	Deduces analytical framework from theory Describes the four components of the framework Links the four components functionally to one another Makes explicit the purpose of the analysis by relating selected structures and processes to purpose (theme) Extracts relevant evaluation criteria from theory Operationalizes these criteria	Refers to framework when making transitions from: a) establishing context to developing purpose (theme) b) developing theme to identifying methodology c) developing methodology to initiating presentation of evidence d) ending presentation of evidence to evaluation e) evaluation of regime to presenting conclusion Uses analytical framework to organize research findings Makes concluding statement related to purpose and to findings
Scale of Performance:	**GOOD** Develops theme as purpose of analysis Paraphrases using full terminology: regimes, system, functions, structures, comparison Paraphrases with respect to hierarchy of theoretical components Links paraphrase to analytical framework **MEDIUM** Restates theme but does not develop as purpose Paraphrases with omissions **POOR** Does not develop theme Does not attempt paraphrase Attempts paraphrase but actually copies from text	**GOOD** Selects, defines and relates appropriate structures and processes Describes analytical framework, makes functional links of components and links selected structures and processes to purpose of analysis as developed in theme Extracts criteria from theory that is relevant to selected structures and processes and to purpose of analysis Operationalizes criteria **MEDIUM** Attempts description but lacks explicit understanding of the functional relationships among components Lists structures and processes but does not relate to the purpose (theme) States rather than extracts criteria **POOR** Does not describe analytical framework Attempts description but lacks comprehension of theory Does not select structures and processes Does not extract criteria from theory	**GOOD** Makes all transitions from a) to e) above Uses analytical framework to organize coherent presentation of research findings Applies appropriate criteria to evaluate specific research structures and processes Makes conclusion in tune with findings and purpose **MEDIUM** Makes some transitions Attempts to organize research findings but lacks coherence due to use of inappropriate components Attempts conclusion but has lost sight of purpose **POOR** Does not make transitions from a) to e) above Does not use components of analytical framework to organize research findings Does not apply evaluation criteria Applies wrong criteria Does not make concluding statement Reaches unwarranted conclusion

generally exhibit the following characteristics in their papers. They state the theme but do not provide sufficient development. Hence they have difficulty maintaining a sense of purpose throughout. Their comprehension of comparative theory is tenuous in that key pieces are missing in the paraphrase and the hierarchy of concepts is not respected. By and large the medium student fails to appreciate the importance of the notion of system in the analysis and tends to focus singly on structural functionalism. As a result, this student is unable to see the connections among various components of the political regime which, in turn, leads to a paper written in a descriptive mode.

Because of this inability, medium students usually have difficult deducing their analytical framework from the theory of comparative politics. They launch into a mechanistic description of the components of the regime which remains isolated from the previous section of their papers. Similarly, in the selection of specific structures and processes retained for analysis, the same difficulty recurs. These are not linked to the purpose of the analysis because the theme was not developed earlier. The selection of evaluation criteria is carried out in a theoretical vacuum, where relevancy is not clear and these criteria are frequently not operationalized. This student demonstrates a lack of understanding of the interrelatedness of the whole which, in turn, can be traced back to an ignorance of the systems approach.

Built upon shaky theoretical foundations, these papers come unstuck when time comes for application. In some cases transitions are not made and sections of the paper stand in stark isolation one from the other. In other cases, continuity is obtained by the mechanical use of transitional devices rather than through an organizational structure. As does the good student, this student will rely on the organizational framework used in the source material or fall back on a chronological approach to organize the result of the research. Occasional attempts are made to put the paper back on track but these are, for the most part, unsuccessful. For example, the odd criterion may appear out of nowhere or an obscure reference may be made to a characteristic of the ideal democratic regime. However, this student does attempt a conclusion, with varying degrees of success, which relates back to the original theme. The majority of papers fall into this category.

At its best, the poor paper states the theme but does not develop it. At its worst, there is no reference to a theme. Where an attempt is made to paraphrase the theory, it is actually copied from the text. These students frequently do not understand the nature of the task, nor do they have any grasp of the concept of theory, let alone that of comparative politics. Where a description of the analytical framework is attempted it fails because of this lack of comprehension. Application is floundering, the paper is incoherent, organization is lacking throughout. Frequently these students will plagiarize from their few (often single) sources, seemingly without realizing it. Conclusions are unwarranted, unconnected to the material presented or simply not made.

In summary, the good student achieves the first two levels of the ability, comprehension of theory and development of an analytical framework, without much difficulty. At the third level, difficulties are encountered when it comes to using the analytical framework to organize the material. The medium student encounters difficulties immediately when attempting to put together a theoretical framework. The first two levels of the ability are not completely achieved. This then leads to an inability to carry through the third level and the papers grinds to a halt. This is followed by an attempt to put the paper back together again with a concluding statement. The poor student does not understand the task and has no comprehension of the theoretical framework. For this student, the first two levels of ability are beyond reach.

This detailed documentation of the development of an assessment task demonstrates the central place that such tasks have in an abilities based curriculum. It has been shown that when the task components are integrated with each other and with other tasks, a deep approach to learning is generated in students (Biggs, 1991). Students who adopt a deep approach to learning are more likely to produce high quality, well-structured outcomes which reflect the complex goals of postsecondary education. The joint paper developed for the *OMEGA* curriculum represents one example of an *OMEGA* learning task which integrates analytical thinking with reading and writing in a performance context specific to the Social Sciences. However, the inductive and recursive process described may be used by teachers in any discipline to develop criteria, determine levels of ability and establish minimum standards of achievement. Finally, this process provides a model that allows teachers to translate taxonomies describing general abilities common to all disciplines into clearly stated outcomes specific to a particular program which are meaningful, teachable and measurable.

Six

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QUANTITATIVE ANALYSIS: METHOD

Research Design

This research project used two methods for assessing student learning: curriculum-embedded assessments and standardized measures of student achievement.

An ability cannot be observed in the absence of the actual performance setting. Therefore, curriculum-embedded assessments, like the one described in the previous chapter, were designed to evaluate student performance within the classroom curriculum context. The goal of these assessments was to gather evidence about how students were approaching, processing, and completing academic tasks required for successful performance in the Social Sciences. These assessments functioned as both teaching and measuring instruments, and as such, formed a major component of the abilities based curriculum. Results from these assessments provided constant feedback to the students on their learning, and allowed teachers to adjust the next phase of instruction. These instruments were also used to document individual mastery of the complex, integrated abilities.

Using curriculum-embedded assessments to compare the performance of students in the research project with other student groups would have been impossible and inappropriate. These assessments did not exist when the project began and had to be developed as the project evolved. In addition, other student groups were not receiving an abilities based curriculum. Therefore, more traditional, standardized measures of student achievement were used.

Standardized measures are commercially made and relate to the curriculum only in a general way. It follows, then, that using standardized measures to draw conclusions about the effectiveness of an abilities based curriculum must be done with caution. These quantitative measures did provide baseline data on the overall ability of incoming students and estimated the presence of various group traits after one year in Cégep. Standardized measures, therefore, were used in this study as a particular methodology embedded in the broader concept of assessment. A non-randomized pre-test/post-test design was used to analyze the standardized measures of student achievement.

Measures

Measuring instruments were chosen to assess the intellectual abilities defined by researchers, which are needed for success at the postsecondary level (Astin, 1974; Bowen, 1977; Mentkowski & Strait, 1983). Measuring instruments (Table 1) were selected to assess general academic ability, reading, writing, metacognition and academic achievement.

Table 1 — Measures Used in Study

ABILITY	MEASURE
General Academic Ability	Otis-Lennon School Ability Test
Reading	Nelson-Denny Reading Test (Forms E & F)
Writing	Writing Placement Test Interdisciplinary Project Research Paper
Metacognition	Learning and Study Strategy Inventory Study Process Questionnaire (used only in 1993-1994)
Academic Achievement	High School Average

General Academic Ability

The *Otis-Lennon School Ability Test* (OLSAT), Sixth Edition, was used as a measure of general ability. This test is designed to measure those verbal, quantitative, and figural reasoning skills that are most closely related to scholastic achievement. This complex of abilities is assessed through performance on such tasks as detecting similarities and differences, solving analogies and matrixes, classifying, and determining sequence. The OLSAT provides, in addition to raw scores, derived scores based upon age and derived scores based upon grade in school. It also provides Verbal and Nonverbal part scores in addition to a Total score and a School Ability Index (SAI). The SAI is a normalized standard score with a mean of 100 and a standard deviation of 16. The OLSAT was hand scored and then converted to standard scores. The SAI was the primary score used to measure and compare students taking part in this study. Level G (Grades 9-12) was group administered to students in the Experimental and Control Groups at the beginning of the Fall term in each year of the study.

Reading

The *Nelson-Denny Reading Test* was used to measure reading ability (vocabulary and comprehension). The vocabulary section consists of 100 items, each with five answer choices, and has a time limit of 15 minutes. The Comprehension section contains reading passages and 36 questions, each with five answer choices. It has a time limit of 20 minutes. Eighteen of the comprehension questions are primarily literal items and 18 are interpretive items. The literal items require that the reader grasp specific details and facts, whereas the interpretative items require that the reader note relationships, draw conclusions, make generalizations and deductions, determine the writer's purpose, and identify the main idea. Comprehension passages reflect a variety of subject-matter fields so that the test does not favor students in any one discipline. The Nelson-Denny Tests were computer scored and then converted to standard scores. Form E was used for the first observations (September 1991, 1992 and 1993), and Form F for the second observations (May 1992, 1993 and 1994).

Writing

The *Writing Placement Test*, used by the English Department at Champlain College, was used to assess the writing ability of students before they began Cégep. Students were given one hour to compose one sample essay. Each essay was read and scored by two members of the English Department and ranked on a scale of one to five. Students who receive a score of one exhibit major problems with syntax, idiom and vocabulary. They are often second language students and require a course in English as a second language. Students who receive a score of two are usually English speaking students who have an extremely weak vocabulary. Their paragraphs and essays are devoid of any clear structure and their sentences are riddled with major grammatical problems. Students who receive a score of three demonstrate basic writing skills and a good conventional vocabulary. However, their essays lack a clear structure and their sentences exhibit major grammatical problems such as fragments and run-ons. They require a basic composition course. Students who receive a score of four have a good basic vocabulary and essays that are generally well organized. However, they might fail to provide adequate support for their arguments. These students would benefit from a literature course that provided some assistance with the writing process. Students who receive a score of five are considered to be literate; they exhibit an extensive vocabulary and understanding of the structure of a paragraph and the structure of an essay. Their sentences contain no major grammatical problems.

Interdisciplinary Project: Social Science Research Paper

In the 1994 Winter term, Champlain Regional College offered the *Interdisciplinary Project Social Science* course, which is the final course in the new Social Science curriculum. In this course students are required to write a research paper that compares two different theoretical perspectives on a sociological problem. In an attempt to validate the long-term results of the *OMEGA Project*, the research papers of six experimental and five control group subjects, who participated in the research project during the 1992-1993 academic school year, were assessed by an external evaluator.

Metacognition

The *Learning and Study Strategies Inventory* (LASSI) and the *Study Process Questionnaire* (SPQ) were used to assess each student's ability to reflect upon themselves as a learner and control their own learning process.

The LASSI is an assessment tool designed to measure students' knowledge of learning and study strategies and methods. It is both a diagnostic and prescriptive measure by which both the student's thought processes and behaviors are assessed. The LASSI was chosen because it is frequently used to assess student use of learning strategies at the college level.

There are 77 items on the LASSI. For each item, the student is asked to darken the letter that corresponds to how well the statement describes them from *not at all typical* to *very much typical* of the student. The LASSI yields ten individual scale scores, one for each of ten subscales: Attitude, Motivation, Time Management, Anxiety, Concentration, Information Processing, Selecting Main Ideas, Study Aids, Self Testing, and Test Strategies. Each scale, with the exception of the selecting Main Ideas Scale, has eight items. Selecting Main Ideas has five items. Coefficient Alphas for the scales range from a low of .68 to a high of .86 and test-retest correlation coefficients from the scales range from a low of .72 to a high of .85, demonstrating a high degree of stability for the scale scores. These scale scores can then be compared both numerically and graphically to percentile score equivalents provided with the LASSI.

The LASSI takes approximately 15 to 20 minutes to complete. It uses a self-report format and does not require any special administrative procedures. It also has a simple scoring scheme that can be used by students to compute their own scale scores right on the instrument.

The *Study Process Questionnaire* (SPQ) was used to assess how students approach learning. It was only used in the third year of the study (1993-1994). The Study Process Questionnaire is a 42 item group administered instrument (Biggs & Collis, 1982). Each item consists of an affirmative self-report statement that describes a student's approach to or motive for learning. An example of a strategy statement is "I summarize suggested readings and include these as part of my notes on a topic." An example of a motive statement is "I find that at times studying gives me a sense of deep personal satisfaction." Students are asked to respond on a five-point Likert Scale to what extent they agreed or disagreed that the items described their approaches to and reasons for learning.

Six subscales on the questionnaire are designed to identify the dominant approach to learning being used by the student: surface motivation and surface strategy, deep motivation and deep strategy, achieving motivation and achieving strategy. A student whose motive for learning is at a surface level is only concerned about meeting the minimal requirements of an assignment or learning task. They might, therefore, employ a surface strategy such as rote memorization of facts, rather than try to understand the subject at a deeper level. A student whose motive for learning is deep has an intrinsic interest in what is being learned. They are attempting to develop competence in particular academic subjects. They might try to discover meaning by reading widely, and interrelating their new knowledge with what they already know. A student who has an achieving motive is learning for the enhancement of their ego and self-esteem. They would like to obtain the highest grades, regardless of whether or not the material is interesting. An achieving strategy might be to organize one's time and working space in order to study effectively.

Seven items of the questionnaire are constructed to reflect each of the six subscales. The subscales are further combined to give scale scores for Deep Approach, Surface Approach and Achieving Approaches to learning. For example, the degree to which a student is using a Deep Approach to learning is determined by adding the deep motivation and deep strategy subscales. Likewise, for Surface Approach, surface motivation and surface strategy subscales are combined.

Academic Achievement

High school averages, first term averages, second term averages, and final cumulative averages at the end of the first year were used as measures of academic achievement. The number of courses passed and failed in the first and second term were also calculated. High school averages, term averages and final cumulative averages were obtained from student records in the college.

Subjects

In the Spring of 1991, 1992 and 1993 all students admitted into the Social Science and Commerce programs received a brochure describing the *OMEGA Project* inviting them to join. Admission into the project was voluntary and on a first-come first-served basis. Fifty-six students enrolled in 1991, 60 enrolled in 1992 and 31 enrolled in 1993.

Experimental and Control Groups 1991

In the Fall of 1991, two class sections of mixed Social Science ($\underline{n}$ = 31) and Commerce ($\underline{n}$ = 25) students became the Experimental Group. This Experimental Group consisted of 18 male and 38 female subjects ranging in age from 16 to 25. Most students were 17 years old (52%) or 18 years old (39%).

The Control Group consisted of 23 male and 38 female subjects, also ranging in age from 16 to 25. Most students were 17 years old (51%) or 18 years old (34%).

Experimental and Control Groups 1992

In the Fall of 1992, two class sections of Social Science ($\underline{n}$ = 27) and Commerce ($\underline{n}$ = 33) students became the Experimental Group. This Experimental Group consisted of 23 male and 37 female subjects ranging in age from 16 to 23. Most students were 17 years old (32%) or 18 years old (50%). In contrast to the first year of the project, when all students were mixed together, the addition of the new *Quantitative Methods* course, required that Social Science and Commerce students be separated into two class sections (see page 33).

The Control Group consisted of Social Science (n = 31) and Commerce (n = 25) students, with 18 male and 38 female subjects, ranging in age from 16 to 25. Most students were 17 years old (51%) or 18 years old (39%).

Experimental and Control Groups 1993

In the Fall of 1993, one class section of mixed Social Science (n = 25) and Commerce (n = 8) students became the Experimental Group. This Experimental Group consisted of 16 male and 17 female subjects ranging in age from 16 to 18. Most students were 17 years old (64%) or 18 years old (33%).

The Control Group consisted of Social Science (n = 25) and Commerce (n = 10) students, with 22 male and 13 female subjects, ranging in age from 16 to 25. Most students were 17 years old (51%) or 18 years old (39%).

Securing and Maintaining the Control Groups

In 1991 and 1992 students were solicited through their English classes to take part in the research project. There was an attempt to have an equal number of Social Science and Commerce students in both the Experimental and Control Groups. There was also an attempt to match the levels of writing (English department placement results) represented in the Experimental Groups in each Control Group. For example, if the Experimental Group had 15 students who would have been able to choose any literature course they wanted, 15 students at the same level were sought after to take part in the Control Group. An attempt was made in the third year of the project to match Experimental and Control subjects on the basis of their incoming high school averages and English placement writing scores. Participation in the Control Group was voluntary. Each student in the Control Group was interviewed by the coordinator of the research project, where the results of their incoming measures were discussed.

As in any research project of this nature, maintaining the participation of the Control Group required heroic efforts on the part of the research team. In the second and third of the study it was decided to pay students for their participation. When they came to discuss their initial results they received five dollars. When they rewrote the measures in the Spring, they received ten dollars. Paying students who took part in the Control Group definitely encouraged their participation.

Completers and Noncompleters

In each Experimental Group, completers were students who completed the *OMEGA Project* and subsequently rewrote the standardized measures of achievement at the end of the school year. In each Control Group, completers were students who rewrote the standardized measures at the end of the year.

Control Group — Completers and Noncompleters: 1991, 1992 and 1993

In all three Control Groups, no significant differences were found between students who completed the study and students who did not on the incoming measures of ability (OLSAT) and achievement (NDRT and high school average).

In 1991, 34 (56%) students completed the study; 27 (44%) students did not.

In 1992, 45 (80%) students completed the study; 11 (20%) students did not.

In 1993, 23 (66%) students completed the study; 12 (34%) students did not.

Experimental Group — Completers and Noncompleters: 1991, 1992 and 1993

In the second and third Experimental Groups (1992 and 1993) no differences were found between those who completed the study and those who did not on incoming measures of ability and achievement. Differences were found, however, within the first Experimental Group.

In 1991, 45 (80%) students completed the study; 11 (20%) students did not.

In 1992, 32 (53%) students completed the study; 28 (47%) students did not.

In 1993, 26 (79%) students completed the study; 7 (21%) students did not.

An ANOVA between the Completers and Noncompleters on all incoming measures of achievement, indicated that the students who left the program at the end of the first semester in 1991, began Cégep with a significantly higher standard score in vocabulary (as measured by the NDRT) than students who completed the program. There was no difference, however, in their comprehension scores. In contrast, students who completed the program began Cégep with a significantly higher score on two subscales of the LASSI: Motivation and Self-Testing. Completers also scored higher on two other LASSI subscales, Attitude and Time Management, but the difference did not reach statistical significance. These results are summarized in Table 2.

If vocabulary is accepted as a general measure of cognitive complexity or ability (Coleman, 1971; Davis, 1944; 1968; Thorndike, 1973; Thurstone, 1946), these results suggest that the students who left college did not do so because of a lack of ability, but because of a lack of interest in college, the absence of educational goals, an unwillingness to prepare for classes and tests, and a failure to use time management principles.

Table 2

Completers vs. Noncompleters—Experimental Group—1991

	Completers ($n = 45$)	**Noncompleters** ($n = 11$)
Vocabulary SScore	297	304
Vocabulary Percentile	47	69
Motivation Percentile	60*	30
Self Testing Percentile	55**	35
Attitude Percentile	60	30
Time Management Percentile	60	45
High School Average	75	71
Term 1 Average	72**	60

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*$p < .05$ **$p < .01$

Analysis of Data

An ANOVA was performed on the Otis-Lennon School Ability Test, the Nelson-Denny Reading Test, the Learning and Study Strategies Inventory, and each student's overall high school average to determine if there was a difference between (1) students in the Experimental Group and students in the Control Group when they began Cégep, and (2) students who completed the study and students who did not.

To determine if there was a change over time in reading ability and knowledge of learning strategies for students in the Experimental and Control Groups separately, a paired T-Test was performed between their pre- and post-test scores on the Nelson-Denny Reading Test and the Learning and Study Strategies Inventory and the Study Process Questionnaire (1993 only).

To determine if the analytical thinking and writing abilities stressed in the *OMEGA Project* were apparent in student performance two terms later, an external assessor evaluated the research papers of five experimental and five control group students who participated in the study from 1992 to 1993, and were enrolled in the same *Interdisciplinary Project Social Science* course. An ANOVA was performed to compare group means.

Seven

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QUANTITATIVE ANALYSIS: RESULTS

This chapter reports the results obtained from the standardized measures used to compare the performance of *OMEGA* students with other student groups. The results are divided into three sections. The first section reports the findings on measures used to assess incoming ability—the Otis Lennon School Ability Test, the Writing Placement Test and high school averages. The second section reports the findings on measures used to study change—the Nelson-Denny Reading Test and the Learning and Study Strategies Inventory. Thirdly, findings of the Study Strategies Questionnaire and the Interdisciplinary Project, two additional measures used in the last year of the study, are reported. The chapter ends with a discussion about the patterns that emerged in the data over the three year period of this study.

INCOMING ASSESSMENTS

1991 - 1992 - 1993

Academic Achievement

High School Averages

In each year of the study, an ANOVA between the Experimental and Control Groups on their overall high school averages did not reveal any differences. Results are summarized in Table 3.

Table 3

High School Averages of Experimental and Control Groups

Observation	Experimental	Mean	Control	Mean
1991	(n = 56)	72.81	(n = 61)	73.12
1992	(n = 60)	74.73	(n = 45)	73.97
1993	(n = 33)	73.10	(n = 35)	72.03

General Academic Ability

Otis-Lennon School Ability Test

In each year of the study, an ANOVA between the Experimental and Control Groups on the Total, Verbal and Nonverbal School Ability Indexes did not reveal any differences. Results are summarized in Table 4.

Table 4

School Ability Index Means and Standard Deviations
Experimental and Control Groups—By Year

	GROUP	SCHOOL ABILITY INDEX	MEAN	SD
1991	Experimental	Total	100.00	10.60
	(n = 56)	Verbal	98.29	10.33
		NonVerbal	103.75	11.84
	Control	Total	100.49	13.50
	(n = 61)	Verbal	99.90	13.96
		NonVerbal	102.80	16.19
1992	Experimental	Total	98.67	12.32
	(n = 60)	Verbal	98.50	11.78
		NonVerbal	100.89	13.03
	Control	Total	101.61	14.61
	(n = 45)	Verbal	98.27	19.95
		NonVerbal	102.45	15.75
1993	Experimental	Total	103.42	13.12
	(n = 33)	Verbal	104.19	13.34
		NonVerbal	104.54	14.04
	Control	Total	104.35	8.80
	(n = 35)	Verbal	102.87	9.71
		NonVerbal	107.09	10.27

Writing

Writing Placement Test

In each year of the study, incoming writing scores indicated that all five levels of writing ability were represented in both the Experimental and Control Groups. Writing instruction was needed by 55% of the students in 1991, 46% in 1992 and 52% in 1993. The writing of these students lacked a clear structure and their sentences exhibited major grammatical problems. These results are summarized in Table 5.

Table 5
Writing Ability of Incoming Students—Experimental & Control Groups—By Year

	Experimental		**Control**	
—1991—	Frequency	Percent	Frequency	Percent
Needs ESL Course	3	5.36	7	11.48
Needs Remedial Work	5	8.93	7	11.48
Needs Essay Course	22	39.29	23	37.70
Intro to Literature	11	19.64	9	14.75
Allowed to Choose	15	26.79	15	24.59
Total	56	100.00	61	100.00

	Experimental		**Control**	
—1992—	Frequency	Percent	Frequency	Percent
Needs ESL Course	4	6.67	3	5.36
Needs Remedial Work	5	8.33	5	8.93
Needs Essay Course	19	31.67	22	39.29
Intro to Literature	19	31.67	11	19.64
Allowed to Choose	13	21.67	15	26.79
Total	60	100.00	56	100.00

	Experimental		**Control**	
—1993—	Frequency	Percent	Frequency	Percent
Needs ESL Course	4	12.12	2	5.71
Needs Remedial Work	6	18.18	4	11.43
Needs Essay Course	7	21.21	22	57.14
Intro to Literature	4	12.12	2	5.71
Allowed to Choose	12	36.36	7	20.00
Total	33	100.00	35	100.00

OUTCOMES ASSESSMENT

1991 - 1992 - 1993

For this part of the analysis, pre and post assessments in reading and metacognition are reported. Only the scores of those students in both the Experimental and Control Groups who completed the study were examined.

Reading — 1991

Nelson-Denny Reading Test

Changes in Vocabulary Over Time

In 1991, students in the Experimental Group began Cégep with an average vocabulary standard score of 297 and completed their first year with an average standard score of 301. Students in the Control Group began with an average vocabulary standard score of 298 and completed their first year with an average standard score of 302.

A paired T-Test between the pre- and post-test scores for each group revealed a significant upward linear trend ($p < .001$). Therefore, in both groups vocabulary significantly increased during the first year at Cégep. These results are summarized in Table 6.

Table 6

Means and Standard Deviations of Vocabulary Standard Scores for Experimental and Control Groups—Sept. 1991 and May 1992

Group	Observation	SScore Mean	SD	T	Percentile
Experimental	1991	297.00	10.54	4.47	47th
($n = 45$)	1992	301.09*	9.77		51st
Control	1991	298.00	12.52	5.33	49th
($n = 34$)	1992	302.74*	11.56		53rd

*$p < .001$

Changes in Comprehension Over Time

In 1991, students in the Experimental Group began Cégep with an average comprehension standard score of 295 and completed their first year with an average standard score of 303. Students in the Control Group began with an average vocabulary standard score of 295 and completed their first year with an average standard score of 301.

A paired T-Test between the pre- and post-test scores for each group revealed a significant upward linear trend ($p < .001$). Therefore, in both groups comprehension significantly increased during the first year at Cégep. These results are summarized in Table 7.

Table 7

Means and Standard Deviations of Comprehension Standard Scores for Experimental and Control Groups—Sept. 1991 and May 1992

Group	Observation	SScore Mean	SD	T	Percentile
Experimental ($n = 45$)	1991	295.00	11.45	7.47	40th
	1992	303.00*	9.28		55th
Control ($n = 34$)	1991	295.20	10.33	2.99	40th
	1992	301.06*	10.39		51st

*$p < .001$

Reading — 1992

Changes in Vocabulary Over Time

In 1992, students in the Experimental Group began Cégep with an average vocabulary standard score of 304 and completed their first year with an average standard score of 305. Students in the Control Group began with an average vocabulary standard score of 307 and completed their first year with an average standard score of 305.

A paired T-Test between the pre- and post-test scores for each group separately did not reveal a significant change in vocabulary over time. Therefore, in both groups vocabulary did not change during the first year at Cégep. These results are summarized in Table 8.

Table 8
Means and Standard Deviations of Vocabulary Standard Scores for Experimental and Control Groups—Sept. 1992 and May 1993

Group	Observation	SScore Mean	SD	T	Percentile
Experimental	1992	304.18	7.99	.75	69th
(n = 32)	1993	305.25	9.69		62nd
Control	1992	307.80	11.28	1.11	75th
(n = 37)	1993	305.10	16.35		62nd

Changes in Comprehension Over Time

In 1992, students in the Experimental Group began Cégep with an average comprehension standard score of 300 and completed their first year with an average standard score of 304. Students in the Control Group began with an average vocabulary standard score of 305 and completed their first year with an average standard score of 304.

A paired T-Test between the pre- and post-test scores for each group separately revealed a significant upward linear trend for the Experimental Group (p <.01).In contrast, the comprehension scores of the Control Group decreased. These results are summarized in Table 9.

Table 9 — Means and Standard Deviations of Comprehension Standard Scores for Experimental and Control Groups—Sept. 1992 and May 1993

Group	Observation	SScore Mean	SD	T	Percentile
Experimental	1992	300.32	12.69	3.02	53rd
(n = 32)	1993	304.75*	11.32		56th
Control	1992	305.23	14.05	.76	66th
(n = 37)	1993	304.27	13.59		56th

*p <.01

Reading — 1993

Changes in Vocabulary Over Time

In 1993, students in the Experimental Group began Cégep with an average vocabulary standard score of 303 and completed their first year with an average standard score of 307. Students in the Control Group began with an average vocabulary standard score of 304 and completed their first year with an average standard score of 305.

A paired T-Test between the pre- and post-test scores for each group separately revealed a significant upward linear trend in Vocabulary for students in the Experimental Group. Therefore, the vocabulary scores of the Experimental Group increased during the one-year period of this study. In contrast, the vocabulary scores of the Control Group did not change. These results are summarized in Table 10.

Table 10 — Means and Standard Deviations of Vocabulary Standard Scores for Experimental and Control Groups—Sept. 1993 and May 1994

Group	Observation	SScore Mean	SD	T	Percentile
Experimental	1993	303.04	12.21	4.57	67th
(n = 27)	1994	307.17*	10.05		76th
Control	1993	304.45	10.25	.42	69th
(n = 23)	1994	305.61	12.92		71st

*$p<.001$

Changes in Comprehension Over Time

In 1993 students in the Experimental Group began Cégep with an average comprehension standard score of 299 and completed their first year with an average standard score of 305. Students in the Control Group also began with an average vocabulary standard score of 298 and completed their first year with an average standard score of 301.

A paired T-Test between the pre- and post-test scores for each group separately revealed a significant upward linear trend for the Experimental Group (p <.001). Therefore, the Experimental Group increased in comprehension during the one-year period of this study. In contrast, the comprehension scores of the Control Group did not change. These results are summarized in Table 11.

Table 11

Means and Standard Deviations of Comprehension Standard Scores for Experimental and Control Groups—Sept. 1993 and May 1994

Group	Observation	SScore Mean	SD	T	Percentile
Experimental	1993	299.00	11.11	3.83	51st
(n = 27)	1994	305.38*	8.97		66th
Control	1993	298.45	12.75	.16	50th
(n = 23)	1994	301.69	13.65		55th

*p<.001

Metacognition — 1991

Learning and Study Strategies Inventory

Changes in Learning and Study Strategies Over Time

A paired T-Test between the pre- and post-test raw scores of students in the Experimental Group indicated a significant upward linear trend in six subscales of the LASSI: Anxiety, Selecting Main Ideas, Information Processing, Study Aids, Test Strategies and Concentration.

A paired T-Test between the pre- and post-test raw scores of students in the Control Group indicated a significant upward linear trend in two subscales of the LASSI: Anxiety and Selecting Main Ideas. In Table 12, the mean raw score of each subscale, for each group, has been converted into its corresponding percentile.

Table 12

Pre- and Post-test Mean Percentiles of LASSI Subscale Scores for Experimental and Control Groups—Sept. 1991 and May 1992

	Experimental		**Control**	
	Pre-test	Post-test	Pre-test	Post-test
Anxiety	30	55*	40	50*
Main Ideas	40	75*	50	65*
Info Processing	50	80**	55	60
Study Aids	45	85**	45	60
Test Strategies	35	70*	50	60
Concentration	55	65	55	60
Attitude	50	60	50	60
Motivation	50	60	50	50
Self Testing	65	70	55	55
Time Management	60	65	60	65

*$p < .05$ **$p < .01$

Metacognition — 1992

Changes in Learning and Study Strategies Over Time

A paired T-Test between the pre- and post-test raw scores of students in the Experimental Group indicated a significant upward linear trend in five subscales of the LASSI: Selecting Main Ideas, Information Processing, Study Aids, Test Strategies and Self Testing.

A paired T-Test between the pre- and post-test raw scores of students in the Control Group indicated a significant upward linear trend in four subscales of the LASSI: Anxiety, Information Processing, Study Aids, and Test Strategies. In Table 13, the mean raw score of each subscale, for each group, has been converted into its corresponding percentile.

Table 13

Pre- and Post-test Mean Percentiles of LASSI Subscale Scores for Experimental and Control Groups—Sept. 1992 and May 1993

	Experimental		Control	
	Pre-test	Post-test	Pre-test	Post-test
Anxiety	35	40	30	40*
Main Ideas	30	65**	50	65
Info Processing	40	70***	55	70***
Study Aids	55	75***	45	65*
Test Strategies	45	50**	35	50*
Concentration	60	60	45	50
Attitude	60	60	40	35
Motivation	60	60	45	50
Self Testing	55	70*	40	50
Time Management	65	70	40	40

$^{*}p < .05$ $^{**}p < .01$ $^{***}p < .001$

Metacognition — 1993

Changes in Learning and Study Strategies Over Time

Paired T-Tests between the pre- and post-test raw scores of students in both groups indicated a significant upward linear trend in Information Processing for the Experimental Group, but a downward linear trend in Information Processing and Time Management for the Control Group.

An interesting observation is that scores in Attitude and Motivation decreased in both groups. In Table 14, the mean raw score of each subscale, for each group, has been converted into its corresponding percentile.

Table 14

Pre- and Post-test Mean Percentiles of LASSI Subscale Scores for Experimental and Control Groups—Sept. 1993 and May 1994

	Experimental		Control	
	Pre-test	Post-test	Pre-test	Post-test
Anxiety	45	45	40	40
Main Ideas	30	50	40	50
Info Processing	45	65**	80	60**
Study Aids	40	45	40	40
Test Strategies	45	45	35	35
Concentration	40	50	45	40
Attitude	50	40	40	35
Motivation	45	35	35	30
Self Testing	50	50	35	35
Time Management	50	50	50	35*

*p <.01 **p <.001

Student Approaches to Learning — 1993

Study Process Questionnaire

Changes to Student Approaches to Learning Over Time

A paired T-Test between the pre- and post-test scores of students in the Experimental Group revealed a significant upward linear trend in their Deep Motive subscale. This means that the motive for studying for students in the Experimental Group became more positive during their first year at Cégep. They became more concerned with actualizing interest and competence in their academic subjects. In contrast, no changes were found for students in the Control Group. Results are summarized in Tables 15 and 16.

Table 15
Univariate Analysis of SPQ Subscale Scores **Experimental Group** (n = 25)

	PRE-TEST		POST-TEST		
	Mean	**SD**	**Mean**	**SD**	**T**
SPQ subscales					
Surface Motive	24.00	3.01	24.92	4.51	1.04
Surface Strategy	21.64	2.89	22.00	3.93	.54
Deep Motive	21.32	4.30	22.96	3.34	2.76*
Deep Strategy	20.72	3.28	20.00	4.04	.98
Achieving Motive	25.60	3.79	25.24	3.07	.50
Achieving Strategy	22.48	3.54	20.48	4.66	1.86

*$p < .01$

Table 16
Univariate Analysis of SPQ Subscale Scores **Control Group** (n = 22)

	PRE-TEST		POST-TEST		
	Mean	**SD**	**Mean**	**SD**	**T**
SPQ subscales					
Surface Motive	24.50	3.52	25.00	2.77	.54
Surface Strategy	23.59	4.18	23.00	4.23	.59
Deep Motive	20.59	4.55	21.95	5.00	1.16
Deep Strategy	20.63	5.87	22.59	5.28	1.89
Achieving Motive	23.27	3.89	23.27	4.43	.00
Achieving Strategy	21.45	5.33	20.90	5.72	.64

Writing — 1994

Interdisciplinary Project

In the Winter semester of 1994, five students each from the Experimental and Control Groups of 1992 - 1993 enrolled in the same section of the *Interdisciplinary Project.* In this course students are required to organize, research and write a research paper that analyzes a social, political or economic issue from an interdisciplinary perspective using at least two different disciplinary approaches. The final research papers of these 10 students were evaluated by an external assessor to determine if the analytical thinking and writing abilities stressed in the *OMEGA Project* were evidenced in student performance two terms later. Papers were rated on a scale of one to three, with three being the highest grade and one being the lowest.

A significant difference was found between the students who were taught within the *OMEGA Project* and those who were not. Three students in the Experimental Group received a three, while the other two students received a two. One student in the Control Group received a two, while the other four students received a one. These results suggest that *OMEGA* graduates were better able to analyze, synthesize and compose a coherent research paper when compared with students who did not receive an abilities based, integrated curriculum. Results are summarized in Table 17.

Table 17

Summary of ANOVA between Experimental and Control Group Subjects in Interdisciplinary Project

Group	N	Mean	F Prob.
Experimental	5	2.6	.002*
Control	5	1.2	

*$p < .01$

DISCUSSION

Cégep teachers expect students to be intellectually prepared to perform college-level learning tasks with efficiency and commitment. Students are expected to read with comprehension, think with precision and thoughtfulness, and write with clarity and coherence. Overall findings suggest, however, that while students' intellectual abilities increase while attending Cégep, most students do not begin college with these abilities to any great extent. Many entering Social Science students do not have the writing abilities required for college writing tasks, nor do they have the reading ability required to comprehend college level texts.

Incoming reading and writing assessments demonstrate the need for the continued development of these abilities at the Cégep level. Writing instruction was needed by 55% of the students joining the *OMEGA Project* in 1991, 46% in 1992 and 52% in 1993. The writing of these students lacked a clear structure and their sentences exhibited major grammatical problems. The average vocabulary percentile for these students was 65; the average comprehension percentile was 50. These students were not able to select relevant information, note relationships between ideas, make inferences, or draw conclusions.

Previous research carried out in 1985 indicated that 43% of the incoming students needed writing instruction, and that this need was not influenced by a student's program of study (Bateman, 1987). In 1985 the average vocabulary percentile for incoming students was also 65 and the average comprehension percentile was 54. Current findings, suggest, then, that the reading and writing ability of incoming students has not improved.

During the three years of this study, students in each Experimental Group increased their vocabulary and comprehension abilities during the first year of Cégep. The increase in vocabulary was significant for the first and third Experimental Groups, and the increase in comprehension was significant for all three Experimental Groups. In contrast, the increase in vocabulary and comprehension was significant for the Control Group only in the first year of the study. Although the Experimental Groups increased their vocabulary and comprehension, the increase in comprehension was most dramatic. The average percentile increase in vocabulary was 2% while the average percentile increase in comprehension was 11%. These results confirm the fact that reading abilities can be taught, and that they do improve during the first year at college. They also support research which states that comprehension, particularly the ability to select important information and the ability to draw inferences is a gradually developing skill (Brown & Smiley, 1977), and although children as young as six can often select the main character and sequence events in a simple narrative, the task can become much more difficult if the material is complex, as it is in college level texts.

Linked to the reading and writing expectations of Cégep teachers is the expectation that students will demonstrate a mature and responsible attitude toward knowledge and perform college learning tasks with efficiency and commitment. The findings in this study indicate that many entering students experience difficulty applying appropriate learning strategies to academic tasks. Entering students seem to lack a good deal of knowledge about themselves as learners, knowledge of the task and what is required, and knowledge of the text and how to use it. The average entry score of students in each Experimental and Control Group on all ten subscales of the LASSI fell in the 50th percentile or below. The metacognitive skills most affected by instruction were selecting main ideas, processing information, using study aids and preparing for and taking examinations.

Of particular interest is processing information, an intellectual ability closely associated with successful learning in college. Students in each Experimental Group consistently increased their awareness of which learning strategies activated this ability. In contrast, the Control Group in 1991 did not experience any change, and the Control Group of 1993 experienced a decrease in their awareness of how to process information. Students who are processing information effectively try to connect what they are learning to what they already know, they use their verbal reasoning skills to organize material, and they monitor their comprehension as they are completing the learning task.

The awareness of how to competently approach learning evidenced by the Experimental Groups is supported by the results on the Study Process Questionnaire which indicate that students in the 1993 Experimental Group became more motivated to get deeply involved in the learning process. It is this involvement in the learning process which impacts on what students learn and how they are able to apply their knowledge.

One of the most important ways that students demonstrate their knowledge is through writing. Research suggests that a student's approach to learning can also influence how they approach a writing task. According to Hounsell (1984), students who describe learning as an accumulation of facts or bits and pieces of information, see writing as a loose collection of thoughts and ideas presented in an ordered form. In contrast, students who describe learning as analyzing and reinterpreting knowledge and experience, feel that data and organization are subordinate to the overall interpretation put forward by the writer. In both groups, the writing often reflects the students' conception of learning. Results in this study confirm Hounsell's findings. Experimental Group students who completed the *OMEGA Project* in 1992 and participated in the 1993 Interdisciplinary Project were better able than students from the corresponding Control Group to organize and write a research paper that required an analysis of a sociological problem from an interdisciplinary perspective. In conclusion, the ability to read with comprehension, analyze with thoughtfulness, write with coherence, and apply appropriate learning strategies to an academic task are important components of performance in college. Results in this study strongly suggest that these abilities can be taught and reinforced across the curriculum.

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CONCLUSION

Transitional Learning for College: An Abilities Based Curriculum for Social Science Students, locally known as the *OMEGA Project*, was a three year research project during which a two semester transitional program for incoming Social Science students was developed and implemented. The project was intentionally designed to increase retention and guarantee the quality of learning in its students by implementing an abilities based, integrated curriculum. The theoretical assumptions underlying the project design can be found in current psychological perspectives on learning, cognition and student assessment. However, it largely came about through the efforts of five teachers who shared the philosophy that the development of certain intellectual abilities in students was necessary if these students were going to acquire subject matter knowledge and be able to use that knowledge in a permanent, meaningful way.

During the development and implementation of this project, two major curriculum reforms were enacted by the Ministry of Education in Québec. The first involved ministerial changes to the Social Science program. The second reform, which is currently underway, involves a much larger overhaul of the structure, content and process of education at the Cégep level. These reforms seek to put into place an abilities based curriculum which emphasizes both the acquisition of subject matter knowledge and the cognitive and affective abilities needed to succeed initially in higher education, and subsequently in a complex society. They call for the reexamination of the goals of postsecondary education combined with an elaborate system of classroom and institutional assessment as the means to increase accountability and improve college teaching and learning.

Although the idea for the *OMEGA Project* originated four years prior to the current restructuring of the Cégep system, it represents on a micro level, what the government is now asking the colleges to do on a large scale basis. Therefore, the following discussion outlines what we believe will be the challenges, pitfalls, and benefits that await the Ministry, college administrators, and college teachers as we strive to improve the quality of teaching and learning in our colleges.

Role of Administrations

The current emphasis on abilities based education represents a shift from a simple way of understanding teaching and learning to a complex, relativistic, and dynamic one. If teachers are going to embrace such an approach, they need to move away from a theory of teaching as telling or transmitting knowledge, towards a theory of teaching as intervening to help students change how they conceptualize the world around them. For many teachers this will require that they rethink their educational philosophies and restructure how they organize and teach their curriculum. As in any period of transition, they will find affirmation for many of the teaching practices already in use, while other practices will take on new dimensions or may be found to be wanting.

One difficulty facing postsecondary administrators and teachers who support this paradigm shift is that the emphasis on abilities has emerged simultaneously with a demand for accountability. This emphasis on accountability carries with it an implicit message that post-secondary educators have been less than effective in producing competent graduates. At the same time, there seems to be little recognition of the challenges facing the college instructor, and inadequate attempts to provide professional support. Increased access to postsecondary education has brought to the colleges a much broader segment of the population than has ever before been considered capable of such learning. Although college educators have always been responsible for the intellectual development of their students, an abilities based curriculum forces the teachers to identify what those higher-level intellectual abilities are and intentionally structure their curriculum and instructional strategies around them. College teachers, who are primarily subject matter experts, are being asked to become expert teachers of higher-level intellectual abilities. In some teaching situations, they have the added challenge of teaching those abilities to students, who in a previous generation, would have been denied access to our postsecondary institutions. It is not surprising, then, that teachers feeling criticized and unsupported find it difficult to respond with enthusiasm to a conception of teaching and learning which seems to be a response to what appears to be two conflicting needs, academic improvement and external accountability.

The danger of emphasizing accountability is that it camouflages the fact that the concurrent emphasis on abilities stems from a new understanding of the educational processes and principles that result in meaningful learning. Emphasizing teacher accountability can slow down the application of these processes and principles. It is only through an understanding of what constitutes meaningful learning, and the educational processes that foster it, that administrators, teachers, and students will be able to work together towards quality education. If the reforms can be viewed as an opportunity to improve the quality of student learning, what appear to be two conflicting needs, educational improvement and accountability, can be simultaneously addressed in a positive climate of educational change.

Therefore, the first challenge facing postsecondary educators in this period of reorganization must be taken on by college administrators who need to assume academic leadership and create an environment of openness, cooperation, and activity rather than one of defensiveness, competition and/or passivity. Asking teachers to reflect upon 15 or 20 years of practice requires a trusting environment that encourages innovation. In this environment, teachers are likely and willing to learn from each other. This environment can only be created by academic leaders who are themselves well-versed in the psychology of learning and the literature on school effectiveness.

Therefore, if the Ministry of Education and local college administrations want abilities to be the underlying core of the curriculum, then they have to create a culture which sustains it. One way to understand what administrators are asking of the faculty, is to compare it to what teachers ask of students in the classroom. In fact, changing how teachers view the teaching process is not unlike changing how students view the world around them.

For students the 'world around them' includes the subject matter knowledge and ways of thinking in a particular discipline. Students learning a new discipline have to become familiar with new concepts and principles, connect the new information to what they already know, become aware of and address any misconceptions, and finally apply their new learning to solve complex problems. Over time, the new knowledge is assimilated into their existing cognitive structures and new behaviors result. These cognitive changes are most likely to occur in an atmosphere of openness, trust and guidance where students are encouraged to examine, question, discuss and decide. The teachers' job is to motivate students by providing the context and the conditions that facilitate active learning. The students' job is to allow themselves to become actively involved in the learning process.

For teachers the 'world around them' includes the subject matter knowledge and ways of thinking about the pedagogy of their common discipline—teaching and learning. If we want them to change their view of the teaching process, they too, have to become familiar with new concepts and principles, connect the new information to what they already know, become aware of and address any misconceptions, and finally apply their new learning to solve complex problems in the classroom. Local administrations have to motivate teachers by providing the context and the conditions that facilitate active learning. The teachers' job is to allow themselves to become actively involved in the learning process.

For example, the teachers who were involved in the *OMEGA Project* all understood teaching as facilitating student learning; they believed that students created their own knowledge as a result of active involvement with the subject matter. As the students became actively involved in the learning process, they collaborated with their peers, and developed a lifelong commitment to learning. As the teachers created the conditions that resulted in meaningful learning for the students, the project created the conditions that involved the teachers in a parallel learning process about teaching. These teachers were receptive to ideas for change as they thought and talked about what they did. They created classrooms where students could engage productively with learning tasks, while as a team, they created meetings where teachers could openly discuss teaching tasks. They shared ideas, triumphs and failures. The teachers became actively involved in the teaching process, they collaborated with their peers and reinforced their lifelong commitment to teaching.

None of the teachers involved in the project wants to return to what they often refer to as their "old way of teaching," yet each of these teachers would have been classified as master teachers by their peers before the project began. It is evident, then, that a few survival tips on lecturing, assessments or working with groups presented in a one day staff development workshop will not be sufficient to initiate and sustain the changes in teachers' conceptions of teaching and learning that have to take place. Just as students need to understand that learning is a lifelong process, teachers have to recognize that learning about teaching is also a lifelong process. Therefore, the teaching processes that result in meaningful learning are the same processes that academic administrators will have to put into place if teachers are going to change their conceptions of teaching.

The first step in establishing a commitment to studying the teaching process is to recognize that the process of change will be gradual and hesitant. Teachers will pass through cycles of experiment, error, and progress towards more complete comprehension. Therefore, one must be concerned about the speed at which the Ministry seems to expect the changes to be implemented. It is often the case that educational changes are implemented and evaluated without allocating enough time to planning them. Adding, eliminating or reorganizing the subject matter of certain courses in a discipline are changes that can be undertaken quickly. Changing how teachers view teaching, however, involves a much longer and more complex process. Ignoring this process and attempting to integrate the principles underlying the reforms quickly is likely to result in superficial outcomes.

Quite unintentionally, this happened with the *OMEGA Project*. In the initial stages, when teachers were working through a new course, it was difficult, if not impossible for them to focus on identifying and teaching for abilities. They had to first feel comfortable with the subject matter. It was only then that the question of what intellectual abilities were required to learn the subject matter could be addressed. However, control groups were established and followed in each year of the project. Ideally, comparisons between groups of students receiving the treatment (an integrated, abilities based curriculum) and those who did not, should have been made after the treatment was more thoroughly designed. It is now, in the fourth year of the project, that time and effort comparing an experimental with a control group would be most useful.

There is a lesson here for Ministry officials who are planning to put exit exams in place by the Spring of 1996. Students entering Cégep in the Fall of 1994 will not yet be the recipients of a well integrated, abilities based curriculum. Teachers, by necessity, will be involved with mastering new content and translating general government objectives into specific objectives that are teachable and assessable. Establishing these common goals and assessment criteria is the most important step in this process. Establishing clear criteria both raises expectations and lets everyone in the educational system know what is expected for success. Articulating these common goals, keeps them at the center of the educational changes, and prevents all those involved from forgetting that the reason for this entire process is to improve the quality of student learning. Launching exit exams before this part of the process is well underway will only serve to increase teachers' anxiety levels and create negative feelings toward a worthwhile educational movement.

Role of Faculty

The second challenge of the current reforms, implementing an abilities based curriculum within each department and across each program, falls to the faculty. Teachers can begin by identifying the cognitive processes or intellectual abilities exhibited by experts in their disciplines. The purpose of this step in the process is to reach consensus about what students should learn. When no one agrees on what students should learn, then each part of the program pursues different, and sometimes contradictory goals. As a result, the educational program as a whole is riddled with inequity, incoherence, and inefficiency.

Thinking about a discipline in terms of the intellectual abilities required for competent functioning in the field, represents a new way of thinking about teaching and learning for many teachers. They must now consider not only what the student has to "know," but also what the student must be able to "do" as he or she becomes more and more expert in the discipline. Although the Ministry has provided general performance objectives for each new course, it is still necessary for teachers to transform these objectives into abilities, tasks, and criteria for performance. The vocabulary that emerges must be understood and accepted by each department and each program. Although there are many taxonomies that teachers can refer to, including the one appearing on pages 49 and 50 of this report, it is important that the vocabulary adopted be meaningful to most teachers in the discipline. Ultimately, the agreed upon abilities become the center of the classroom processes and assessment tasks that are, then, intentionally designed, to foster the development of these abilities in the students.

Developing an abilities based curriculum can be a long and difficult process. It will require extensive collaboration within and between departments. The benefit, however, of engaging in such a process is that the hidden curriculum, which consists of the intellectual abilities postsecondary education is responsible for developing in its graduates, becomes visible, tangible and subsequently, more teachable.

A New View of Classroom Assessment

In an abilities based curriculum, assessment becomes an integral part of the learning process because it is viewed as the primary route to the development of the abilities. A second challenge facing faculty, therefore, is to reexamine their views on assessment. Teachers often separate teaching from assessment, while students view assessment as central to learning. Assessment has to do with student outcomes, but it also shapes the meaning of curriculum and instruction and of the professional role of teachers. If the goals of instruction have moved away from an emphasis on content to an emphasis on abilities then students must be evaluated on the degree to which they have mastered the abilities. This requires the creation of assessment methodologies that are closely linked to the goals of instruction.

As this research project progressed, it became apparent that effective assessments could not be designed until the abilities that we were trying to develop in our students were identified. This required a deep analysis of the intellectual abilites necessary for understanding the subject matter in each course, along with an analysis of the intellectual abilities demonstrated by experts in the discipline. In other words, when classroom assessment is effectively implemented as part of a well-thought-out curriculum, authentic or curriculum-embedded assessment can provide teachers with the types of diagnostic information necessary to serve the individual needs of students in their class. On the other hand, if the classroom curriculum is weak, fragmented, or misguided, the resulting assessments used to evaluate student progress will not provide diagnostic information or serve the academic needs of the students.

Designing effective assessments is one of the most important processes in teaching. Assessment activites have to be designed to increase the probability that students will adopt deep approaches to learning. Teachers need to develop the ability to use the results of tests and assignments to change instruction so that it more accurately addresses students' errors and misunderstandings. Evaluations are needed that provide a clear indication of the depth of understanding of the concepts, principles, relationships, and processes that constitute the substance of a course of study.

The Successful Student and Excellence in Education

The results in reading, writing and metacognition demonstrate the need for the continued development of these abilities at the Cégep level. Although Cégep students arrive at college with a certain amount of background knowledge, many content areas are being studied for the first time. In addition, the problem solving strategies transferred from high school may not be appropriate for college learning tasks. Despite these constraints, college students are faced with academic tasks that require both extensive background knowledge and proper strategies for organizing that knowledge into a readily learnable mode.

Cognitive-developmental theorists believe that changes in thinking are interactive with changes in the environment (Bloom, 1964; Inhelder & Piaget, 1958). The environment creates a disharmony forcing individuals to accommodate their existing cognitive structure or way of thinking. Current results suggest that the ability to reflect on one's own cognitive processes is important for becoming an effective learner; however, it develops late. If Cégep is to create the environment which aids individuals to change or accommodate their existing cognitive structure or way of thinking, then students must learn to comprehend and control their own learning processes. The challenge to the Cégep teacher is to introduce appropriate problem situations which will help students develop the much needed abilities. The ability to introduce conflict in the form of academic tasks which are appropriate to the students' level of development, yet stimulating enough to promote growth, may represent the most important part of the teacher's contribution to the development of students' intellectual abilities.

The cognitive and affective processes that underlie competence in college suggest a prototype of a successful student and an excellent college. Successful students are effective problem solvers, they can characterize the current problem or academic task. Successful students have formal and informal strategies for learning, know how and when to use these strategies, and monitor the effectiveness of the strategies they choose. Most importantly, successful students recognize that they are responsible for their own learning.

The prototype of the successful college student can be used to generate criteria for defining an excellent college. Excellent colleges recognize the intellectual abilities inherent in the learning tasks of postsecondary education, diagnose the competencies that learners bring to this task environment, adapt to individual differences, and subsequently provide environments that encourage active, independent learning in their students.

The role of instruction in the college, then, should be concerned with the development of the intellectual abilities that differentiate performance in a particular discipline. The teacher and the student become equally responsible for this process. It is the responsibility of the teacher to develop curriculum and create teaching strategies that simultaneously connect with and extend the cognitive and affective development of students. It is the responsibility of the college student to become actively involved in the learning process. The college student ideally learns to be a good reader, a competent writer, a critical thinker, an independent learner, a creative person, and an inquiring individual. Therefore, an excellent college creates a culture which intentionally nurtures the intellectual development of its students and the professional development of its teachers.

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RECOMMENDATIONS

Viewed as a microcosm of what postsecondary education can be, and in light of the recent reforms aimed at restructuring college level learning, the *OMEGA Project* stands as an important work which offers significant insights. The lessons gleaned here can be instrumental in establishing guidelines for college administrations and college faculties.

Recommendations for Administrations:

1. The Ministry of Education, Commission de Evaluation, DIGEC and college administrations marshall release time resources to give teachers the time and financial support needed to develop and implement an abilities based curriculum.
2. The focus of the first two years of the college reforms be on developing the abilities based curriculum rather than on instituting accountability measures.
3. The Mission Statement of each college be reviewed and rewritten to reflect an abilities based curriculum.
4. Colleges define how an abilities based curriculum is useful outside of the classroom in adult life and disseminate this information to students and parents.
5. An adequately staffed Teaching Center be created in each college where teachers can meet to collaborate and receive professional support.
6. Periodic pedagogical days (more than one a year) be set aside each semester to allow for designing the abilities based curriculum.

7. Colleges take into account the basic tenet of an abilities based curriculum: that group work and the interactive classroom requires small classes.

8. Colleges institute registration and scheduling practices that encourage the formation and operation of collaborative teaching modules.

Recommendations for Faculties:

1. Program teachers elaborate clearly stated, measurable abilities that are in tune with program outcomes for each discipline in the program and for each course within each discipline.

2. Each ability be defined in terms of levels of competence and performance criteria.

3. Learning/assessment tasks be designed that match the level of these abilities.

4. Course plans (objectives) be formulated in terms of abilities, criteria and learning tasks.

5. Program and English teachers collaborate in the development and teaching of an abilities based integrated curriculum for first year students.

6. Program and English teachers collaborate to create writing tasks that help students develop the analytical abilities required by each program.

7. Program and English teachers collaborate to develop a common vocabulary that describes the components of academic papers and the performance criteria for written assignments, and that students be introduced to this vocabulary and criteria in the first year of college education.

8. Teachers receive training in the construction of assessments which elicit the development of higher order thinking abilities.

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